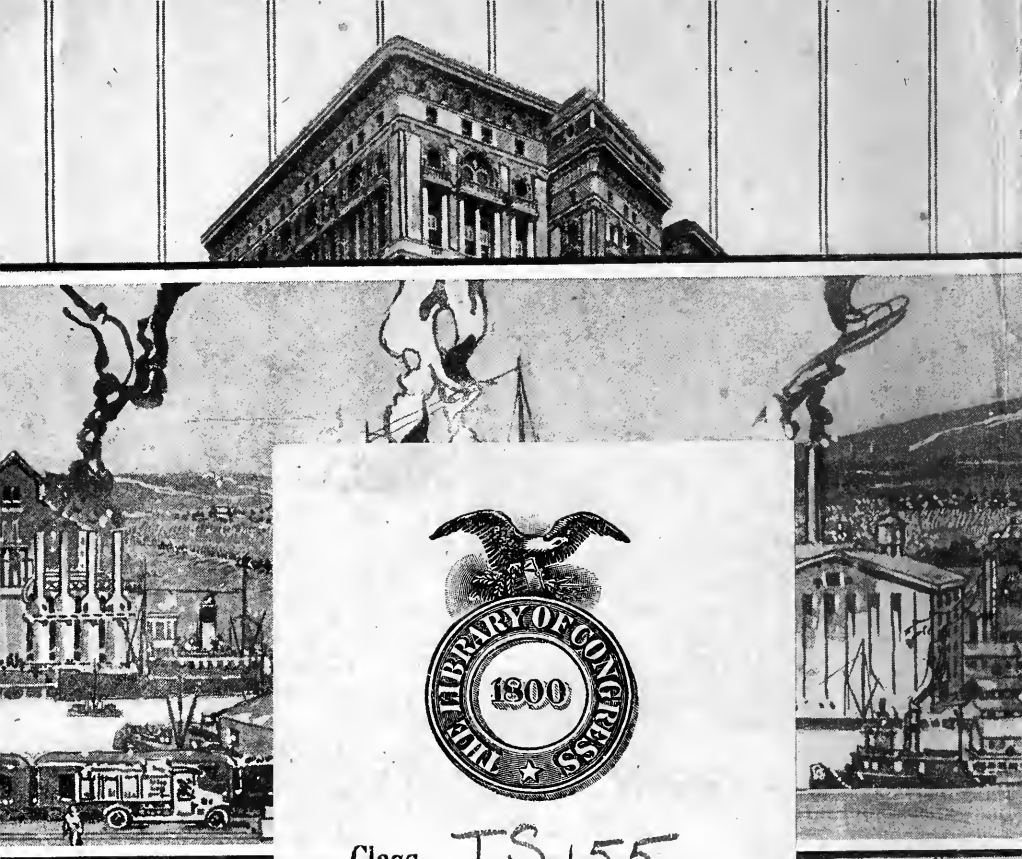

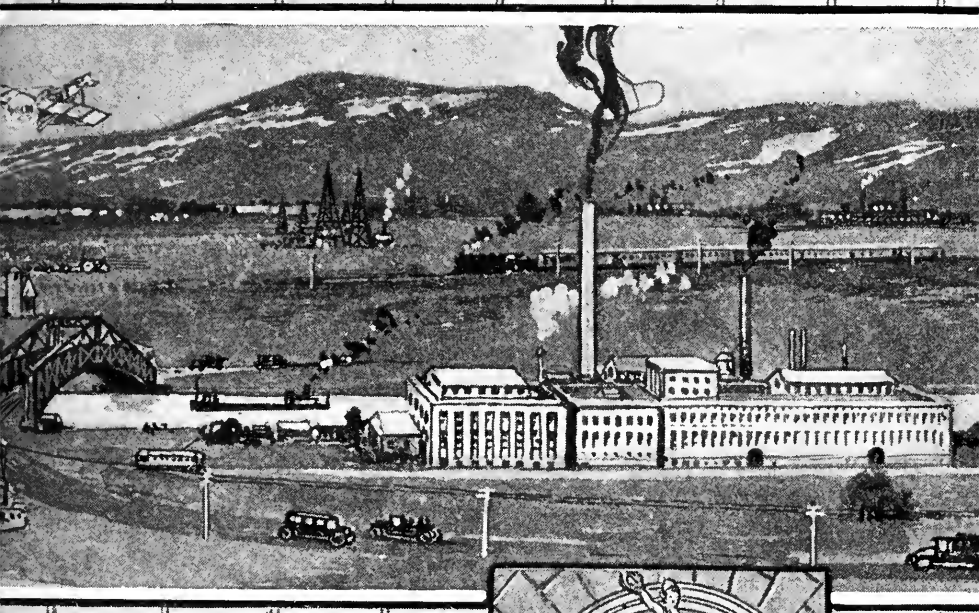

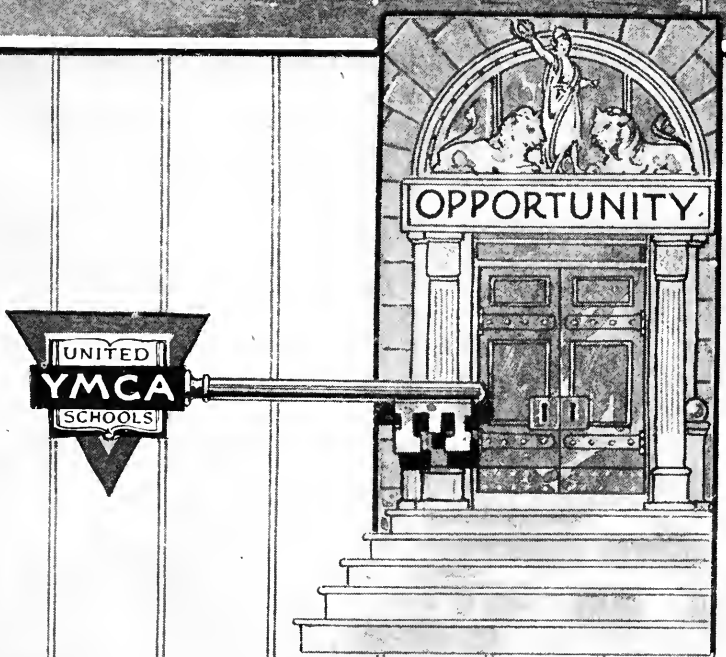
OPPORTUNITY
UNITED
YMCA
SCHOOLS

Foremanship

THE STANDARD COURSE

OF THE

UNITED Y. M. C. A. SCHOOLS

BOOK I

THE FOREMAN AND HIS JOB

BOOK II

MATERIALS AND THEIR HANDLING

BOOK III

EQUIPMENT AND MACHINERY

BOOK IV

ORGANIZATION AND MANAGEMENT

Foremanship

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THE STORY OF MANAGEMENT,
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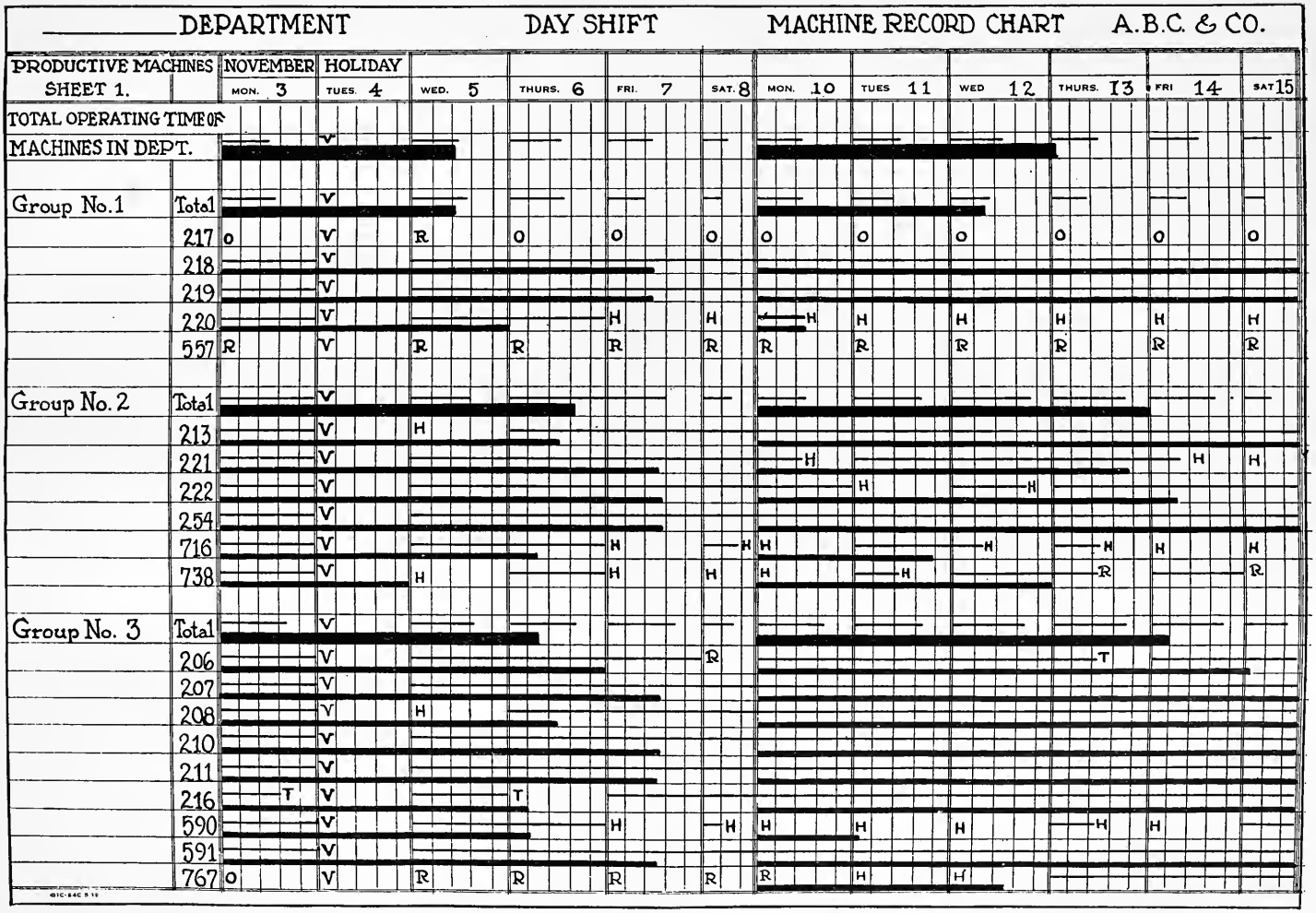

Figure 4. For explanation see pages 110-113.

The Foreman And His Job

Part I

BY

WALLACE CLARK

Part II

BY

HARRY TIPPER

BOOK I

ASSOCIATION PRESS

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PREFACE

The work and duties of foremen in industrial plants have undergone sweeping changes during the past decade. While greater responsibilities for getting out the product have been placed upon them, they have been all too frequently left alone without training sufficient to meet the new conditions as effectively as could be wished. Foremen constitute by far the largest executive group in industry—the group that *gets things done.* Formerly, the foreman's job was many-sided. He had to look after the purchasing of materials and supplies, the repairing of machinery and equipment, the designing and making of special tools, the securing of manufacturing orders, the keeping of workmen's time, the setting of wage rates, and the hiring and firing of workers. These functions, in part or in whole, are still his in many small plants; but in large ones they have been transferred to well-organized departments managed by trained men—sometimes schooled specialists.

Modern industrial methods, however, make it necessary for a foreman to have fairly exact knowledge of many things not required even ten years ago. Among these new duties may be mentioned the economic control of the process of manufacture, the profitable utilization of time, the efficient handling of equipment, the keeping of correct records, and the proper management of workers.

To meet these new duties and to assume the responsibilities imposed by them, many foremen,

even in well-organized plants, need help and training such as they have never received through their experiences in learning a trade and, later, in managing a factory section or department. In order to satisfy that need of the foreman for knowledge of sound production practice, the United Y. M. C. A. Schools planned the comprehensive Foremanship Course embodied in these four textbooks and their accompanying Reading Assignments. The course does not profess to give an exhaustive treatment of the subjects discussed, but it does present the *fundamentals* of foremanship—the subjects in which the modern foreman must be thoroughly grounded—and thus provides the foreman with tested shop practice and methods which he may adapt to his own needs.

The dual treatment of the subjects in the course, as well as their grouping into four books of four chapters each, is in keeping with a policy and method developed by the United Y. M. C. A. Schools as most serviceable in gaining and holding the interest of the reader. Each of the sixteen chapters is divided into two parts. The first part deals with the material and technical side of some problem—methods, stock, tools, machinery, organization, management, and so forth. The second part discusses the human side of the problems in industry—relations between the foreman and his men, between the employes and the management, between the industry and the community, and other subjects having to do with human relationships in industry.

In addition to the text material of the four books, eight Reading Assignments form part of the course; and a very important part, too, for, on the one hand, they present the historical side of industry and, on the other, they show the vitalizing spirit which has imbued industry in its evolution to the commanding position which it now occupies.

The content of this course is authoritative and sound. The authors were selected, not only because they are men of recognized ability as mechanical and industrial engineers, but because they see all sides of the problems which confront industry and the foreman as the "key" man in it. They understand human motives, and the spirit of service which is more and more actuating men to put their best effort into their work, whether that work be managing a plant employing 20,000 men or making the simplest part of a product in that plant.

Four authors—Messrs. Wallace Clark, Walter N. Polakov, Joseph W. Roe, and Harry Tipper—each thoroughly acquainted with modern industry, have collaborated in writing the four textbooks. Who these men are and what they have done is presented in another place — the introductory booklet of the course; but this much may be said here: Mr. Clark wrote Part I of Book I; Mr. Roe is the author of Part I of Book II; the first part of Books III and IV was written by Mr. Polakov; while the major task of authorship was

undertaken by Mr. Tipper, who prepared Part II of all four books.

The Reading Assignments were prepared by men whose names carry weight for ability and reputation in the great field of industry. They are Leon P. Alford, George F. Barber, Frank O. Clements, Henry L. Gantt, Henry W. Shelton, Charles P. Steinmetz, Charles R. Towson, and Robert B. Wolf.

These authors, both of Texts and Reading Assignments, have contributed willingly and gladly to making the course interesting and instructive. Special credit is due Messrs. Alford, Barber, Tipper, and Wolf for their advice and counsel in the many conferences which led to the planning of the content of the course, and for subsequent assistance in coordinating the work of the various authors. Mr. Alford, especially, as Directing Editor, has been unremitting in his contribution of time and knowledge, both in formulating the outline of the course and in reading the authors' manuscripts.

This Foremanship Course is, therefore, the composite product of able men working together to serve industry by helping the foreman to understand how big his job is, and to equip himself to fill it so well that he will become, in the highest sense, a capable manager of men and an efficient supervisor of production.

WILLIAM JESSUP SHOLAR,
General Editor.

A TALK WITH THE FOREMAN

In taking up this study of foremanship, let it be understood that you are not expected to surrender any ideas which have been worked out in your own experience to the profit of your men and of the company. You will, however, most likely find in the course suggestions which will supplement your own experiences and make them even more profitable in securing production.

It is to be hoped that you approach the course with a mind entirely open, for in that spirit only is it possible for a man to get the most good out of anything. The fact is, that while your own experiences are valuable and you necessarily rely upon them, the experiences of other foremen in other plants are equally valuable if you can get hold of them. That is exactly what this course brings to you—the composite experiences of many foremen and industrial engineers. It is, therefore, worthy of your earnest study. It will also be well worth while for you to *test,* in your own work, the practices here set forth in so far as you can apply them. In that way only will you be able to derive the largest benefit from the course.

Begin, then, by reading carefully the booklet called "Foremanship—A Key to the Course," which tells you in an interesting way how this course was built. Familiarize yourself, especially, with the chart outline of the course which you will find in that introductory booklet. There are two reasons for this close study of the contents of the entire course, namely:

First, the whole subject of foremanship will be seen in its coordinate relationships.

Second, you will thus quickly become familiar with this modern method of presenting text material.

You will note that there are two collateral divisions shown in the chart outline. These are Part I: The Job, and Part II: The Foreman. You will realize that the course is treating, in Part I, of *your job,* or the technique of foremanship; while Part II treats of the development of *you,* the *man,* in your relationship, as a foreman, with your fellowmen. This plan is carried through each of the sixteen chapters which make up the four books.

Let me call your attention, also, to the series of Reading Assignments prepared by men who are, by experience, well equipped to write on the subjects treated by them. These give you, in an interesting way, additional information which you may not have time to secure through your own research or collateral reading. You will note that each Reading Assignment relates itself to Part I or Part II, respectively, of each book. There is, too, another feature of the course, as shown in the outline, which you should understand is of vital importance; namely, the Project—the solution of which will enable you to apply the principles set forth in the textbooks and their accompanying Reading Assignments. And, too, in working out a Project you will have an opportunity to exercise your own initiative.

Plan of Handling Material

If you are a member of a Y. M. C. A. class in foremanship, you probably will receive the material of the course as follows: At the meeting when the class is organized, Book I will be given you. When the class meets for its first session, you should receive Project No. One. At the second class meeting, the first Reading Assignment will be passed out. At the third session, the second Reading Assignment will be placed in your hands. You will then have received a complete Study Unit—a Textbook, two Reading Assignments, and a Project. At this fourth class meeting there should be a discussion of Project No. One, and you should ask such questions as will clear up anything about it which you may not understand. Book II will be given to you at this session, and thereafter a Study Unit will be distributed in the order already indicated.

How to Study

In approaching the study of each chapter let us remember that it is divided into two parts. Part I presents The Job, or the mechanics of foremanship; while Part II considers The Foreman in relation to his job, to his fellowmen, and to himself as a man whose powers need to be developed consistently and intelligently in order to achieve worthwhile success. These two parts of each chapter should be studied in the light of their vital relationship. They are closely interlocked, so that neither part taken by itself can give full value

to the student. This is an important point; for, if you miss any portion of either part, you will find yourself crippled in the next chapter. Do not slight a page nor a paragraph.

Foremanship is not a subject to be "soaked up." It is not a dry, abstract body of knowledge, but an activity; and to master it presupposes activity in the student. You must *work*—work with earnestness and concentration. "The sun never burns until its rays are focused." Focus your thought, therefore, on this course; for—

> *If you put little into this study, you will get little out; if you put in much, the range of your possible benefit is limitless.*

Note carefully the headings so that you may know precisely what each *chapter* and *section* and *paragraph* teaches. Underline the sentences that seem to contain the meat of the paragraph. Go back every little while for review, not only to clinch your knowledge of the previous section, but also to make the present and future chapters easier. Get the notebook habit. Jot down any idea that strikes you as most vital; and carry the notebook in your pocket for reference when the text is not handy.

Get All the Benefits

When you complete a chapter—that is, after the class has discussed it—turn to the questions at the end of the chapter and answer them to yourself. If there are any that you cannot answer fully and clearly, go back to the text and find the

answer. Upon receiving a Reading Assignment, read it as soon as possible—read it *twice*. Compare its statements with what the textbook says and note the points of agreement or disagreement, if any.

When a Project is given you, *work it out* while the whole book is fresh in mind. The Project is designed to crystallize some of the principal ideas of the book into a concrete situation for you to work out. It is a test of *your* grasp of the practices and methods enunciated. You alone lose if you do not work out the Projects.

Take part in the class or group discussions. Ask questions and do your full share when called upon by the instructor, or group leader, to give a statement of your opinion. You thus help yourself and the other members of the class. Pursue the course faithfully and get the benefit which is to be derived from the experiences of others. You must always be a learner; for *"Instruction ends with the schoolroom, education ends only with life."* Knowledge of a trade or profession is the *tool* with which we do our work; the *skill* that distinguishes the master is acquired only by *practice.*

This course should help you, not only to master your job as a foreman, but also to understand the laws of successful living, so that you will take your proper place in the social order and serve humanity efficiently. Thereby you will inevitably deserve and receive just reward and happiness.

ARTHUR H. MYER,
Director, Department of Commerce.

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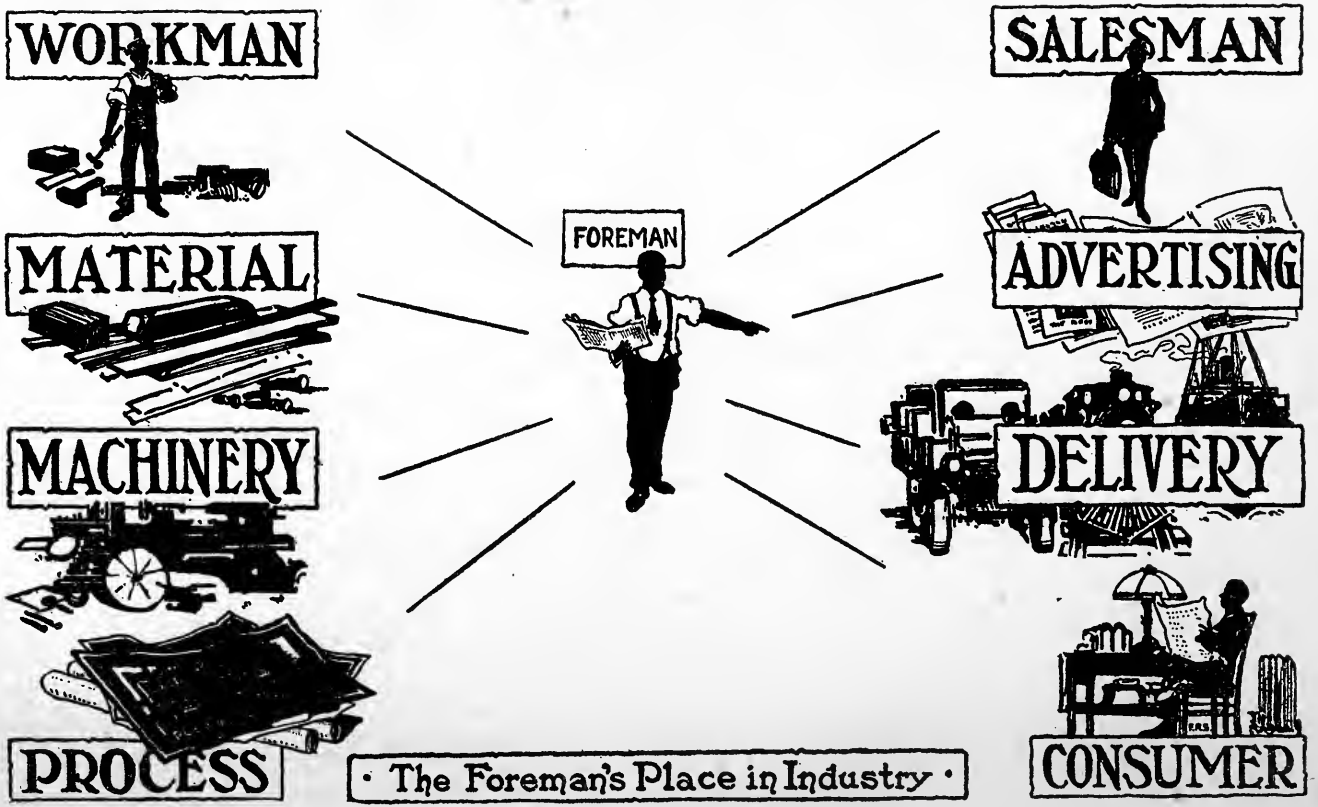

WORKMAN
MATERIAL
MACHINERY
PROCESS
FOREMAN
SALESMAN
ADVERTISING
DELIVERY
CONSUMER
· The Foreman's Place in Industry ·

Part I: The Job

THE FOREMAN'S PLACE IN INDUSTRY

Section I

Importance of the Foreman

The Evolution of Foremanship.—"The maintenance of our modern civilization is dependent absolutely upon the service it gets from the industrial and business system." It is not now necessary to support this statement, made by a famous engineer, H. L. Gantt, by referring to the effect of the partial paralysis of our transportation facilities, of coal mining, or of the steel industry. We do not realize until we stop to think of it how much we are dependent on the daily service we get from industrial organizations of one kind or another.

Until recently the administration of most American manufacturing plants has been in the hands of one or two men in each plant. These men, who were the owners or their representatives, made all the important decisions, but as they became more and more removed from the actual operation of the business, their administration became less effective. During the Great War, the mistakes and delays in the production of war materials were due largely to the practice of referring matters for decision to a central headquarters where it was not possible to have all the facts available. Even before the armistice

the tide had begun to turn toward decentralization of control where decisions are made by men who know the facts because they are close to the job. This movement toward decentralization is spreading slowly throughout American industry and more and more responsibility is being placed on the foreman—*the man who "knows what to do and how to do it."*

Forty or fifty years ago, when shops were small, the owner was usually the best workman and showed the others how to do a job. He told each one what to do, he bought material, and, when the work was finished, saw that it was shipped. He also saw to it that bills were sent out, and frequently collected the money himself.

As shops grew larger it was impossible for the owner to look after all the important parts of his work, so he delegated some duties to others. To a Sales Department he delegated the task of finding out what goods were needed and when; to an Engineering Department the task of determining what materials should be used, what machines or equipment were needed, and the processes through which the material should go; to a Purchasing Department the task of securing the material; to an Employment Department the task of securing the necessary workmen; to the foremen the task of bringing together the workmen, material, machines, and processes and producing the goods; and finally, to the Sales Department the task of distributing the goods manufactured.

In the expansion of American industry this type of organization was developed as the owner was forced to delegate his duties, one by one. These different parts of the business are not always as clearly defined in small plants as in large ones. In such an organization the foreman is the practical man. He is like the lens of a camera which focuses the rays of light from a whole landscape upon a small photographic plate.

The foreman takes the knowledge of all the other parts of the industrial organization and focuses it on the work.

The Foreman Combines the Production Factors.—There are four production factors with which the foreman has to deal. These are

The Workman,
The Material,
The Machine,
The Process.

It is the job of the foreman to combine these factors in proper and efficient relations so as to produce a finished article of commerce. In small plants, the foreman himself selects and hires the workmen; but in large plants, where organization is expanded for the purpose of greater efficiency, the foreman no longer hires the workmen. He does, however, determine what men are needed and makes requisition upon the Employment Department for them. In such plants each job has been standardized so that the qualifications necessary in the *workmen* are card indexed in the Employment Department, which keeps in touch with

the sources of supply for men of the kind wanted and with the market price of labor. It carefully studies the applicants and decides as to their fitness for the work. This saves a great deal of the foreman's time, but he must still devote sufficient time to the training of these men to enable them to do their work properly.

> *The only sure way to tell whether or not a man can do a job is to try him out on that job.*

The Engineering Department, or some one who has adequate knowledge, determines the *material* from which the goods shall be made. In doing this, in many plants exhaustive experiments must be made and chemists, metallurgists, and other experts must be consulted. When the specifications are worked out, the Purchasing Department goes out into the market and buys the material. It must keep in close touch with continual changes in market conditions and in suppliers. Its task is made more difficult by the necessity for weighing the relative importance of date of delivery, of cost, and of quality. When the material is received it is kept by the storekeeper until the foreman is ready to use it.

The *machine* or equipment best suited to do the work is also determined by the Engineering Department, or some one familiar with the design of modern machinery and with the machines on the market. The Purchasing Department buys the machine and delivers it to the foreman.

The Engineering Department, or a man who has technical knowledge and experience, works out the *processes* of manufacture—the method of applying the machine to the material in order to produce the finished article of commerce. This information is given to the foreman in the form of blue prints, written instructions, by word of mouth, or, frequently, it is common knowledge handed down from one workman to another. Into the development of these processes and the design of these machines have gone centuries of experiment and investigation in all the sciences.

The Foreman Puts Theory into Practice.—A good foreman does not hesitate to use the theories or knowledge of other men; in fact, his success depends almost entirely upon his ability to make use of the knowledge of other men. He learns just as much as possible about materials and processes, but no one can know everything. His job is to get information wherever he can and make use of it. He exercises his ingenuity in making that knowledge practical.

In establishing any scientific fact it is necessary to go through a great deal of experimenting. A wise foreman lets scientists do that experimenting and then takes the result of their work and applies it to his particular task. He realizes that modern business is so complicated and its problems so varied that, in order to work out the best processes, build the best machines, or develop the best methods of getting work done, there must be specialists who devote their entire time and atten-

tion to that kind of work. It is natural that such men should know more about their specialty than the average man. If one of these specialists cannot tell a foreman just exactly how to accomplish the result he is after, that is no reason why his ideas should be discarded. Frequently it needs only the practical point of view of a foreman to make that idea work. All the scientific knowledge printed in books, shown on drawings, or embodied in machines and processes is useless until the foreman makes use of it in bringing together the workman, the material, the machine, and the process.

The job of the foreman is
to put theory into practice.

The Foreman Holds the Key to Productive Capacity.—There is a growing appreciation of the fact that the "value of an industrial plant is determined by its productive capacity" and not by the inventory value of the land, buildings, and equipment. The foreman holds the key to this productive capacity. Think of the strategic position occupied by the foremen of our grain elevators, the yardmasters of the railroads, and the foremen of flour mills. We are really dependent upon them for the bread we eat, since they stand between us and the wheat fields.

The way in which the foreman handles his job has a profound effect on the public, but an even greater effect on the worker. His life and his future are in the hands of the foreman. The foreman is the point of contact between the workmen and the management. In the eyes of the

workmen he is the management, and the success of the policies of the management depends largely upon their interpretation by the foreman. The management may have a broad and generous attitude toward employes, but it is absolutely nullified by a foreman who is close and selfish in his treatment of the men under his charge.

The foreman must also present to his superior officers the attitude of the workmen toward the company. This is not a light responsibility, for the actions of his superior officers are largely influenced by what he tells them.

Section II

Responsibilities of the Foreman

The Foreman Must Get the Work Done.—It is the foreman's job *to get work done.* He may be the best workman and so be able to turn out more work and better work than any of his men. This is a great advantage, but that is not the kind of ability which determines the selection of a foreman. The only reason for putting him in control over other men is because of his greater ability to get work done. This does not mean the ability to drive employes to spectacular stunts, or to push one job through in record time at the expense of other equally important work. It means the ability to judge the comparative importance of the various kinds of work assigned to him and to get the work done in the order of its importance.

To accomplish these results the foreman needs all the qualifications of a good executive. There may be men under him who have greater technical knowledge than he has and greater mechanical skill, but he holds his position because of his greater ability to overcome difficulties and get things done.

However, the foreman cannot have an absolutely free hand in getting work done, for he is limited by three elements, namely: Time, Cost, Quality. He must get the work done at the *proper time,* at a *reasonable cost,* and in accordance with a definite *standard of quality.*

The Element of Time Is Gauged by the Workman and the Machine.—The time when the work should be finished is usually determined by the superintendent and the Sales Department, after considering the needs of customers and the other work ahead in the plant. The foreman, who probably does only a part of the work on any article, cannot, of course, know how the work is progressing in other departments of the shop, so he makes no attempt to determine the proper sequence of the orders he has in mind, but depends entirely on instructions received from the superintendent. However, in order to get work done on time, the foreman must plan the handling of his orders carefully so as to make the best possible use of his workmen and his machines.

The Element of Cost Is Regulated by Production Methods.—The cost of *material* is of course dependent upon market conditions and is looked

after by the Purchasing Department. The cost of doing the work (applying labor to the material) is, however, almost entirely in the hands of the foreman and it is his aim to do the necessary work in as short a time as possible without wasting material. In order to do this he must know the best method, must keep his machines in such condition that they can turn out accurate work, must give his workmen full instructions as to how the work is to be done, and must see that it is done in accordance with those instructions.

The Element of Quality Should Be Standardized.—The Engineering Department, the Sales Department, and the superintendent usually agree on the standard of quality after considering the customer's wants and the probable cost. The Sales Department investigates market conditions and concludes that it is to the interest of the company to produce goods of a certain grade in order to meet the requirements of buyers. The Engineering Department translates this into definite specifications, which the superintendent places in the hands of the inspectors. The foreman accepts this standard of quality and attempts to turn out work which will pass inspection.

The Relative Importance of Time, Cost, and Quality.—The *time* when the work is to be completed is frequently more important than the *cost*, and sometimes even more important than the *quality*. The judgment of the foreman must be used in determining the relative importance of these three limiting factors of time, cost, and

quality. No rule can be set down which will apply in all cases, so the foreman will decide each case on its merits after learning the facts; but he will be careful to get the superintendent's approval of his action if it is out of the ordinary.

Complex Problems Confronting the Foreman. Industry is today very much more complicated than it was even a few years ago. It is not very many years since the output of nearly all plants was sold within a radius of one hundred miles of those plants. Today, however, the distribution of the product of some plants is limited only by the extent of railways and steamship lines. In this expansion and the attempt to satisfy the greater variety of needs, the complications both in manufacturing and distribution have increased. However, the mere complexity of business does not stagger the modern business man.

The foreman's job, being such an important part of the business system, has also become more complex. Processes have become more complicated and at the same time the productive capacity has increased enormously. The foreman's job today is as different from what it was twenty-five years ago as an automobile is from a buggy. The mechanism of an automobile is very complex when compared with that of the buggy and it gets out of order much more frequently, but who would think of going back to the old "one hoss shay"? Nor would the foreman of the modern shop think of going back to the methods of the old-fashioned shop.

The foreman is not bewildered by the size of his job nor its complexity; and in attempting to increase his knowledge of modern methods he will not expect to have the matter presented to him in as simple a way as it was usually done twenty-five years ago. Such a difficult problem cannot be made to read as easily as a magazine story. It demands concentration, an honest effort to grasp the matter as it is presented, and a desire to apply the principles set forth to one's daily work with intelligence and persistence.

Section III

Types of Foremen Who Fail

The Self-Important Foreman.—It would be very interesting to go over in your mind the foremen you know and see what is each one's conception of his job, and how he measures up to the idea that the foreman's job is to get work done along lines of modern production methods. Here are some types of inefficient foremen that you will recognize:

There is the foreman who judges his importance by the number of people that work for him. The more men there are standing around waiting on him, the more important he feels. His whole idea seems to be *to have people do things for him.*

There is the foreman who delegates work to his subordinates and then makes all the decisions

for them. The result is that the foreman carries on his shoulders the responsibility for everything in his shop. He is always complaining that his men will not take any responsibility. He does not realize that the best way to get them to shoulder responsibility is to place the full burden on them as soon as they are able to carry it.

There is the foreman who is happiest when everyone in his department depends upon him for information or instructions. He would like to have the whole plant depend on him. He is usually very capable, knows his job, and is always willing to tell men how they should do their work; but as soon as he is away for a few hours or a day there is a decided slump, for his men are so used to asking him *how* that they forget to think for themselves. They put all the responsibility on his shoulders because they know he likes to carry it, and since he insists on worrying there is no reason why they should. This type of foreman seldom realizes that it would be to his advantage to have instructions written down and looked after by one of his subordinates so that he would be free to use his knowledge and judgment only on particularly difficult problems. He does not know how much more he could accomplish in this way. He usually resents any help which is offered to him from outside his department, and when the management insists on giving him any help or instructions he takes it as a personal insult. These are all types of the *self-important* foreman.

The Talkative Foreman.—There is the foreman who would rather talk than do anything else. Sometimes he talks about things not connected with the shop, but usually he talks about business matters. He talks to his men and to his clerks, going over a subject again and again. Every day he goes to the superintendent's office and talks to as many people there as will listen to him, and, at the foremen's meetings, if there are any, he always talks—whether he has anything to say or not. He is so busy talking that he has little time to get work done.

The Foreman Who Wants to Do Everything Himself.—There is the foreman who knows how to do things and insists on doing everything himself. He cannot even tell his men how. If a machine is to be set up for a job that is a little out of the ordinary, he must do it himself to be sure that it is right. If a machine is broken down, he must fix it. He seldom succeeds in getting much work out of his department.

Not long ago a superintendent was describing his experience with a foreman of this kind. His foreman was always so busy repairing a machine, setting up for a job, or even running a machine, that he had no time to run the department as a whole and plan his work so as to make good use of his machines and men.

The superintendent tried every way he could to get that foreman to realize what his real job was, but he could not make any impression on him. Finally, he went down one day and told the

foreman that his department was not being run the way he wanted it run; that orders were not coming through and the work of other departments was being held up; that when he came into the department he found him, the foreman, lying on the floor under a machine and he could seldom get any accurate information as to how a job was going. Therefore, he had made up his mind that a week from the following Monday he was going to put in charge of that department a foreman who would run the department instead of a single machine—the kind of a man who could wear a white collar and keep his hands clean. Of course, that could be done only by letting his repair men and set-up men do all the necessary work on the machines. He wanted a man who could handle the department as a whole and get other men to do things for him. He told the foreman that that was the kind of a man he was going to put on the job, and added that he wished the present foreman would fill the position.

A week later the superintendent came back and asked the man whether or not he had made up his mind to be that kind of a foreman. He was a little bit sore about it, but he decided he would take the job. The next Monday morning he appeared with a white collar and he kept both the collar and his hands clean all day. The superintendent told him how glad he was to see that kind of a foreman in charge of the job and he never again had any trouble with him.

The Toadying Foreman.—There is the foreman who always keeps his eye on his boss and, if there are two or three men higher up in the organization than he is, he is continually running to all of them telling them what he does and asking them what they think about it. This type of man is more anxious to stand in with his bosses than he is to do his job right.

There is another type of foreman who wants to stand in with his men. He thinks that the best way to promote good feeling is to let them do whatever they want; so, if there are several jobs ahead of a man he lets him pick out the easiest one to do next. This, of course, results in the hard jobs being put off from day to day and the schedules of the office are all shot to pieces.

This man does not realize that it is his duty to be fair both to the workman and to the company, and that the Sales Department, which makes promises to customers, is usually the department which should decide the relative importance of jobs.

There is the foreman who tries to advance himself at the expense of everyone around him. By clever strategy and tale-bearing, and sometimes worse, he attempts to give the superintendent a wrong impression of the other foremen so that it will work to his own advantage. He also calls the superintendent's attention to all the fool mistakes of his sub-foremen or his workmen, to show that he is the only one in his department who uses his head. He does not seem to realize that if

they do not know how to do their jobs it is a criticism of him for not teaching them. If this foreman wants the job of a man above him or of some other man with more influence than he has, he carries on a campaign for the purpose of discrediting him in the minds of his superiors, in the hope that he may eventually step into his place.

This type of man is always confidential, and when he is giving this alleged information he is continually looking over his shoulder to see whether anyone is listening.

The Shortsighted Foreman.—There is the foreman who is forever complaining of the shortage of good workmen and yet does not take any pains to make the best use of the good men he has or to train and develop more good workmen.

There is the foreman who never openly refuses to follow instructions—he merely fails to do things until it is too late and then blames the "system" or anything else which comes to his mind.

There is the foreman who is always willing to help some one else. In fact, he is so kind-hearted that he cannot refuse to do whatever anyone asks, even if it does interfere with his own job.

There is another kind-hearted foreman who has a very hopeful disposition; he is sure that everything will come out all right and that there is no use worrying about anything. The result is that he has not the necessary force to see that his orders are executed.

There is the foreman whose principal idea seems to be to get something for himself. Whenever he is asked to do anything, his first thought is, "What will I get out of it?" When he does render any service, he always puts a price on it and attempts to collect it before he delivers the goods.

The Slave-Driver Foreman.—There is the foreman who thinks that the only way to accomplish results is to drive his men hard. His voice can be heard above the noise of the machines and he would be perfectly happy if he had a long whip in his hands. This foreman does not realize that men cannot be driven to do what they do not know how to do; that when men are driven they either plunge ahead and do things wrong or turn against their driver.

It is hard for this foreman to learn that his men must be thoroughly trained in the proper methods of doing their work and then given an incentive—something to make them eager to use those methods.

There is the foreman who "raises Cain" whenever the least little thing goes wrong. When other jobs are hard to get, his workmen swallow his abuse; but when business is good they leave. He goes out to the gate and hires a man to take the place of the workman who has left, and usually gets one who is less familiar with the work and, because of his more frequent mistakes, gives the foreman more reason to lose his temper.

There is the foreman who depends entirely on his muscle and his lung power. Every once in a while he threatens to knock a man down, and for several hours thereafter he is very proud of himself. Fortunately this type is getting scarce—he is a relic of the dark ages.

The "Pass-the-Buck" Foreman.—There is the foreman who is always defending himself. When his attention is called to a mistake he explains at length and proves conclusively that it was not his fault; he is always afraid that he will get the blame for the mistakes of some one else. He is so busy defending himself that he never has a chance to tackle his real job.

Section IV

Types of Foremen Who Succeed

The All-Round Foreman.—No two foremen will do their work in exactly the same way, but the old-fashioned hit-or-miss way of doing things is being cast aside. It is not good enough for the modern foreman, who is reaching out for better methods of getting work done—methods which are just as effective and as up to date as the latest machine tool on the market. This man is making production his sole aim and he is driving toward that aim with a singleness of purpose which assures success. In organizations pervaded with the attitude of "every fellow for himself," where there is a diffusion of resources and energies, he is

making steady progress toward his goal; and because that is not a selfish aim but in line with the needs of the public as well as the company, his reward is bound to come and to be lasting.

This up-to-date foreman assigns clear-cut jobs to all those under his control; he sees that the responsibility of each individual is clearly understood, that is, that each one knows to whom he is responsible and the work for which he will be held accountable. He sees that there are no vague or divided responsibilities and that each one is given the authority necessary to match his responsibility. He has found lack of action and its attendant idleness greater hindrances to production than mistaken decisions, and that the elimination of idleness is more effective in increasing production than the speeding up of either men or machines. He therefore concentrates his efforts on fixing responsibility and on getting those working with him to understand that "the authority to issue an order involves the responsibility of seeing that it is executed."

There is the foreman who does not want his men to run to him with every little thing; so, when they come to him, he asks them what they would do if they were in his place. If their answers do not agree with his ideas, he tells them why. This, of course, encourages men to act on their own initiative and develops their judgment.

There is the foreman who believes that all of his men have brains, and whenever he tells them how to do a job he tells them why it should be

done that way. He knows that he cannot be right there every minute, and that a number of little things will come up which the man can decide himself if he knows just what the foreman is aiming at. This develops judgment in all of his subordinates.

The "Square Deal" Foreman.—There is another type of good foreman who is very careful in the way he handles mistakes of any kind. When something has gone wrong, he thinks over the situation carefully in an attempt to find out the reason for the mistake and to get some good out of it. He realizes that he can make a great improvement in his work by the way he handles mistakes. He finds out whether the man who made the mistake has been given clear and complete instructions which he could be expected to understand. If not, he knows that it is not fair to blame that man. When he has determined the reason for the mistake he decides whether it was due to carelessness, to wrong method, to mistaken judgment, or to some other cause. If due to carelessness or mistaken judgment, he devotes more time to training that particular workman. He does not take the easy way out and designate some one else to check the workman up, but trains him to do it right.

Whenever a mistake is made, this foreman calls it to the attention of the one who made it, but does not "rub it in." He is more interested in avoiding it in future than in scolding the man.

There is the foreman who lays all the cards on the table in dealing with his men, with other fore-

men, or with his superintendent. He does not indulge in personalities, but takes it for granted that everyone else wants to decide the matter on a basis of fact instead of opinion. He does not complain to the superintendent about the shortcomings of another foreman until he has talked the matter over frankly with that foreman, and then, if they do not agree, he gets the other foreman to go with him to the superintendent for a decision. This man usually gets the decision in any argument because he does not start anything until he is sure of his facts. His frankness then usually disarms anyone who is less frank.

The Dependable Foreman.—There is the foreman who gets things done when he says he will. It is not easy to get him to make a promise except when he has the material right in his shop; but when he does make a promise, the superintendent has learned that he can depend on it.

There is a rare type of man who realizes that, when he is given authority over a department, he has to shoulder responsibility for the actions of all his subordinates. He is careful not to issue any orders that he does not expect carried out to the letter, but when he does issue an order he states it with the full expectation that it will be carried out and he usually mentions the time when it is to be done. When that time comes and the work is not done, he finds out the reason why. It is not very long before everyone around him finds out that he means what he says, even if he does not make very much noise about it.

The Open-Minded Foreman.—There is the foreman who gives careful consideration to all suggestions made by his workmen. If the suggestion is good, he adopts it; if not, he tells the person who made it why he is not adopting it. He does this promptly and frankly, even if sometimes it is hard work, because he wishes his workmen to make suggestions since he knows that it will improve the work of the department and increase the interest of his men.

The Foreman Who Truly Serves.—There is another foreman who believes that he is there to render service. He gives the superintendent the best service that his department can render, and gives his men all the help possible. His whole idea seems to be *to give* instead of *to get;* and, of course, the more help he gives other people the more he is able to give them and the more they give him.

The responsibilities being placed upon the foreman's shoulders are heavier than ever before, but there is a new type of foreman arising who is stronger and better able to shoulder the burden. More encouraging even than that is the fact that so many thousands who have been foremen for years are showing that they are able to carry this added load. These men are reaching out for knowledge, visiting plants where up-to-date methods are in use, going to night schools, and even taking courses in colleges to get more knowledge on technical subjects and business methods.

Part II: The Foreman

THE FOREMAN AND MANAGEMENT

Section I

The Foreman and the Workers

Where You Stand as a Foreman.—When I was some years younger, several of us who were living together joined the militia. Out of the six of us, four remained privates and, of the other two, one became a corporal and the other a sergeant. As you can imagine, the four who remained privates were constantly getting up jokes at the expense of the others, when we were out of uniform; also, we insisted that they were lucky, and just got these positions by chance, and that we didn't want to be more than privates anyhow.

One evening, after drill was over and we sat smoking in our rooms, the man who had been made sergeant let go. He gave us a real lecture, which was sufficiently good to live in my memory today. It caught us by surprise, for he was a quiet chap, not much on conversation, but a very good leader. We liked him in and out of uniform and we did not suppose he had given any study to the things he spilled—until he spoke.

"It's pretty tough, you fellows, to have a job of this kind," he said. "I'm supposed to know enough to see that you fellows know your duty. I'm supposed to be able to keep discipline among you. Yet you fellows know well enough I'm no

more intelligent than you are and I don't know so much more about military affairs. If I pretended to, you'd give me the horse-laugh. About all the discipline I'll ever be able to get in our company and my squad will be the discipline you privates will let me exercise, out of good will and a feeling that I'm square with you.

"Now the captain is a little further away from you. You are pretty sure he knows a lot and you pay attention to what he says, but most of your orders come to you through me, and I've got to see that they are finally carried out. So I've got to play square with you and with my superior officers and I guess I can do that only by playing square with the army. Whatever is the right thing for the army is right for us, and we'll be square with each other on that basis."

That is about where you stand as a foreman. Whether you are foreman of a gang of unskilled laborers on the railroad, or of skilled mechanics or of any other workers, you are far closer to them than the other supervisors. Most of the instructions must come through *you;* a large part of the development of the workers must come through you, and you must see that the work is carried out in an orderly and efficient manner. You are not a military leader with power like that of the sergeant I have mentioned; but you are a leader of your group of men and you are close enough to them to get willing service out of them if you go at it right.

The Foreman Represents Skill and Authority. You are in a position to understand the worker's needs and the way in which he fits into his work and into his group. You are in a position to interpret the orders so that he can understand them. You can explain the rules, the necessity for accuracy, the reason for some of the red tape, and the object of the work. Yours is an important part of the chain of supervision. You are so close to the workers that you must needs deal fairly with them if you expect to retain discipline. And you are so necessary to the final work of "doing the job" in an orderly manner that your obligation to the management is very vital and very definite.

Your job demands the possession of certain definite skill in the work which the men in your group are doing. The main reason why you were made a foreman was because you had shown some greater skill in doing the work than the rest of the men. One reason why the men are likely to respect you is because they know "you know what you are talking about"; but this is not enough. These are men whom you have been appointed to supervise and, as men, they give their respect to the man who is not only more skillful than they are but more on-the-square, more intelligent, and more capable.

Your job of foremanship is a big one. To the group of men, you represent the company, the work, and the establishment. You represent authority in industry and a great part of their

feeling about these matters comes from what you say and do about them. Every man who is more skillful than his fellows exercises an influence over them and is able to swing their ideas as well as their admiration. In other words, every man who is called to supervise others because he is more skillful, more intelligent, or more tactful is educating the men he has charge of every day. He is influencing them for the better—better work, better thought, better play—or for the worse in the same way.

The Workers Considered as a Group.—A little later in this course we will consider the *worker as a man,* and his relations to others as an individual. Just now it is necessary to look at that group of workers which you are called upon to supervise.

Physically, they differ amazingly. Some are short and slender, others heavy and tall, others medium. There are the dark and the light; the ones who show deep, lively eyes and the ones who seem to wake up slowly. They walk differently, they have different homes, their work is tackled in different ways. They do not have the same opinions. Some are important, some cool and keen, some will take advantage of anything, and some will refuse to get the better of anybody.

They agree on many matters, but disagree on many others and in the way they see, or think about, things. They agree enough about their work to get along as a group, although they threaten to "bust up" the group if they get involved too deeply in personal differences. Think-

ing them over, you will agree that they all have their good points and there are ways in which you like them. If anyone asked you whom you liked best you might be ready to mention Landers or Maginnes or Carter or Pitovski; but just then you would remember Tony or Jim or some one else, and you would pause wondering whom you approved of most.

Now, these fellows assemble under your supervision, and perhaps you think that you don't have anything to do with their personal agreements or differences. You know better than that. You are too close to the work and too close to its necessities to imagine that any man can work as well if he is "mad" at another man, or thinks some one didn't treat him fairly, or faces any of those other human difficulties which stir up the mind. You know well that a man doesn't do his best work for a boss he isn't interested in and doesn't know anything about. So you are really concerned with this group of workers as men and consequently as individuals, because everything they think affects the kind and amount of work they do during the day when you are supervising them.

Know What Your Men Think.—Probably there is no man in the whole establishment who has occasion to know, as well as you do, the way in which the "job" is affected by the thinking the workman does and the way he feels about things.

Now the job of being a foreman is concerned with getting the best work out of the group of workers under the foreman's supervision, by guid-

ance, by care, and by keeping the group working together as a group. This means that the way in which every man in the group *thinks* about his work is something which concerns the foreman. He wants the men to think right about him and about each other; he wants them to think right about the company and the management, and he also wants them to think right about the work which they have to do.

It is up to the foreman to know how to influence the thinking of his men. Doing this—keeping these men feeling and thinking right—means knowing them as *individuals*—the long and the short, the fiery and the calm, the grouch and the pleasant one. It means knowing how to make the long and the short men feel like twin brothers on the job, how to bring a smile to the grouch, and how to keep the redhead from getting "mad."

Broad Knowledge Is Necessary.—Keeping the workmen feeling right about the company and the management means knowing enough about the company and its policy so that it can be explained clearly. All the red tape of inspection and rejection of work, the stock room requirements, the intricacies of the time sheets and studies is charged up to the management unless it is explained to the men and its usefulness is understood. All the apparent waste—and there is apparently a lot of it even in the best shop—will be counted as inefficiency unless the reason is understood and explained. Because the foreman is the first line of supervision, he is close enough

to the men to be able to deal with these matters and see that the group works harmoniously, thinks well of the company and the management, and puts its interest in the work.

The men, however, must not only understand and feel right about each other, the company, and the management, but they must also know the usefulness of their work and its importance, and feel right about that. Unless they are interested in their work, they will not do a good job at the best speed. They will allow their power to be idle and do only as much as is necessary to get through the day. Their work, its purpose, its necessity, and its value must be understood. The foreman is in the position where he can give them this information and see that it is understood. The foreman is not supervising a job done by a group of workers; he is supervising a group of *men* or *women* gathered together to work at and accomplish a job. The workers come first. The job grows out of the workers, and it is done well or ill according to their ideas and thoughts. The foreman who knows most is best capable of guiding and teaching his men.

Section II

The Foreman as Interpreter

The Necessity for Interpreting.—When I was in the contracting business, years ago, most of the unskilled labor we used was Italian and, in a great many instances, the men could not speak English. It was necessary for us to have a man

with each group who could speak both English and Italian. Some of these men were able to speak the English language but brokenly, and the misunderstandings which arose as to the orders for the work, on various occasions, were very amusing and at times very disastrous.

From time to time I have stood in court and watched the cases come up for consideration where the parties could not speak English, and have wondered how much of the value of the questions was lost in the passage of the message through the interpreter. Particularly, I have wondered how much of the warning of the judge was changed to threat, or of the kindly admonition to peremptory order, because of the difficulty of transferring the personal application in the interpreting of the words.

People who speak the same language can be as far away from understanding one another as though they spoke a different language. The real master of a science is the man who can develop the discoveries in scientific exactness and explain these matters so that children can understand them.

Nearly always it is necessary to have some discussion, some interpretation, in order that all the men in a group may understand a matter thoroughly. Orders are easy to obey if you understand their reason. Systems, records, red tape of all kinds become useful binders, holding the parts of a business together, when the reasons for their use are known. Inspections, time studies, bonuses, and other matters of routine necessity are shown

to be valuable to the worker for his protection and benefit—as well as valuable to the company—when they are thoroughly understood.

Interpreting, then, is quite an important part of the job of supervision. Telling the men about the things they have to do—their importance, their reason, and their purpose—is a great part of the matter.

Understanding Must Precede Interpreting.—You cannot make a matter simple unless you understand it. In fact, it takes a much larger measure of understanding to put a thing into simple terms than it does to repeat the terms used by those who are familiar with it. If you want to find this out thoroughly, try to explain to a nine-year-old boy the action of a machine or an engine, and see how far you can get without talking about pistons and cylinders and gears—words which are technical and not within the boy's comprehension.

There are a lot of things connected with the system of any production or distribution job which are not a part of the necessary knowledge of the worker. They may know Form 101-A as the individual job record, but why it is called that and what it does they have no idea. A little girl who knows there are cylinders in a motor car, and can point them out to you, may have no idea of what they do and why they are shaped as they are.

It is up to the foreman to know why things are as they are and to understand them so well that he can tell about them in words that the workers will understand. But, if you want to interpret

something or make the other man understand it, you must know more than the thing you want to talk about. You must know *whom* you are talking to, what they *think,* and how they *speak.*

Not long ago I heard a man speak to a group of engineers on finance. He knew his subject and what he said was sound and well thought out; but the people were not interested. It was with difficulty that they kept their seats and suppressed their yawns. He knew *what* he was talking about, but he did not know the men he was addressing and how they thought and spoke. He did not speak within their understanding.

It is a big part of the job of a foreman to know his men—to know what they think and how they speak. Only in this way can the matter in which he is interested be brought to their attention so that they will be interested and know the "reason why" of the thing.

Make Your Interpretation Clear to the Workman.—One day, recently, two of my younger children were arguing about something and, hearing the high-pitched voices saying " 'Tis so!" " 'Tis not!", I inquired about the matter under discussion. One of them immediately got me into the discussion by inquiring, "Daddy, doesn't it say 'My country 'tis of thee, Sweet lamb of liberty'?" Of course I corrected the youngster and then explained the song. He was incorrect because he did not understand what was meant. The words were just pleasant sounds to him and

he repeated the sounds without knowing whether they were right or wrong.

Not very long ago I was in a factory where they make small machines. I stopped by the machine of an operator who was punching out a lot of small plates. After awhile I asked him what they were. He said, "P.X. 111."

"You misunderstood my question," I replied. "What are they used for?"

"Oh," he said, "I don't know anything about that."

I suppose P.X. 111 was the job number of the work he was on, but he did not understand the purpose of the work and consequently he could not understand the value of the work he was doing. Somebody had failed to interpret the job to this man so, because of his ignorance, he took no interest in the article he was making.

You may know the workers you are working with and supervising and you may know the things you are dealing with, but unless you see clearly and thoroughly all the matters connected with the job and can be sure that the men understand them, the fact that you know about them will not aid the men or keep their interest.

Most of us know *something* about a lot of things, without knowing *all* about them. We know the *system* of doing things, but the *reasons* for doing them are not so clear. Many things, which we thought we understood, become very difficult to deal with when we are called upon to explain them to some one else; so we are a little inclined to let

the explanations go, or cut them short, or say that the company wants it done that way. It is not an easy matter to explain things so that another person can understand them thoroughly, anyway; and when the person is not familiar with the things by previous experience the matter of explanation becomes more difficult.

Interest Is Aroused through Understanding.—Men are interested in things when they understand them; they lose their suspicions of many things when they get the reasons for them. If they do not understand the routine of the job sheet, the inspection, the time study, and other matters connected with the system, much of it will look foolish to them and will seem like an unnecessary irritation. Many grievances arise from small misunderstandings; and misunderstandings are always due to the lack of good interpretation and a good interpreter. No man is so hopeless that he cannot be made to understand the reasons for the practical things which are connected with his work, and no man is so unintelligent that he cannot become ambitious to do good work. There are a great many men who realize that they cannot become stars and acquire the speed and precision of the leaders; but they like to do a good job with speed and accuracy, and they will do it if they can be kept interested.

You can see the same thing in sports. Many men who play tennis or baseball know they cannot become champions, so they are not fired with any increased ambition by the playing which is accom-

plished by the champions. They may look with admiration upon these heroes of sport, but they do not expect to follow their example and they don't try. They do want to play as well as the other fellows in their class and they hate to be no good at the game. Work, when you are interested in it, is like a game. Very few of us can be champions and we know it, so we don't try very hard to become champions; but we do want to hold our own among our fellows, at work as at play, and we will do it as long as we are interested in the matter.

Our interest, however, depends very largely upon our knowledge and understanding of the work, the rules of the game, and the results. We want to know *what* we are doing, *why* we are doing it, and why we have so many *rules* to follow. Interpreting all these things to the group of workers under your supervision is a big, important part of the job of foreman; and seeing that they understand the interpretation is just as important.

Section III

The Foreman as Subordinate

What Is a Subordinate?—When I first went to work in a shop as a youngster, I used to think about the long line of steps from sub-foreman, to foreman, shop foreman, general foreman, superintendent, works manager, general manager, and so forth. That line looked like a very long stretch and the vision was somewhat discouraging.

As I looked into the matter further I discovered that each of these men was both an officer and a subordinate, taking his authority from some superior supervisor and delegating part of that authority to another subordinate who in turn acted as a supervisor. As I became acquainted with the workings of a factory, from my experiences I found out that all these supervisors had limitations to their authority and also obligations of service to some one else whom they represented. Even the president of the company was limited to certain things by the directors elected by the stockholders, and he was bound by his obligations to them, to the customers, and to the organization.

A great many men are under the impression that the word "subordinate" means blind obedience to somebody above us and a lack of freedom in judgment; but that is not the case. It means, roughly, throwing away your own desires in order that you may do your duty to the organization. It means nothing more than fulfilling your obligations whether they fit into your desires or not.

The Men at the Top Are Subordinates.—I have a friend who is a director of two or three concerns and the president of two. His life is full of meetings. He is obliged to take a vacation at the end of a telephone. He must be away from his family night after night because of this or that business necessity. His obligations are so many that he cannot be sure of any free time. He is a subordinate; he must answer the demands of the different companies with which he is connected.

He must put aside his own affairs to meet committees and to talk with labor leaders and workers; he must consider his community. So, he must be continually subordinating himself to the obligations for service which come out of his capacity and his responsibilities. He does not have *one* boss, and it is true that he does not have to stay in a certain place for a certain number of hours; but he has *many* bosses, and his hours are so uncertain that he is quite likely to lose his evenings, his Sundays, or his vacation.

A subordinate is the man, who, recognizing the fact that he is obligated to carry out the policy of the organization, understands that policy and obeys it intelligently and with judgment, not blindly and ignorantly. The President of the United States is a subordinate, with so much work and so many obligations to so many people that he must be prepared to give twenty-four hours a day, if need be, to that service, intelligently and without question. He must use his judgment and intelligence, not to change, but to carry out the wishes of the government—that is, the people, as expressed by their constitution and their laws.

If we substitute the factory for the government, the systems and methods of the factory for the constitution and the laws, the personnel of the factory organization for the government employes from the President down, then it will be clear that every supervisor is also a subordinate. He is a subordinate, subordinating himself to the policy of the plant, to its organization, to its

system, and to its methods in order to carry out his part of the work of putting these things into practical effect, without respect to his own personal opinion about them. That means, of course, understanding the methods and the systems, understanding their reasons and why they exist, so that they can be applied intelligently and with judgment. This is particularly true of the factory supervisors and especially of the foreman, who is so close to the group of workers.

Fair-Minded Subordinates Play with the Team. The subordinate is the man who cuts out *individual* play for the good of the team; who will make a sacrifice hit, if it is necessary, so that the team can score. He is the man who will obey the coach, not because he may always agree with the coach, but because the coach is charged with responsibility for the team; and every man on the team has to do his best to help him with that responsibility. I have never been able to understand why we should look upon the subordinate position as an inferior part that a man plays. As a matter of fact, it is the greater part, because it requires more vision and intelligence to subordinate one's self for the good of the organization than it does to make the individual play. It is probably for that reason that the wise leaders of industry have said many times that only the good subordinate makes a good supervisor. No man who cannot subordinate himself for the good of the organization can expect to teach a group of men under him how to do that very thing.

The Foreman as an Officer.—The foreman as subordinate is the necessary preliminary to a good foreman as supervisor, and the foreman's place as supervisor is of great importance in the line of management. The close and intimate character of his responsibility gives the foreman the opportunity to express the spirit and character of the organization to the men, and, at the same time, to secure from the men the cooperation and team work which result in the increased efficiency of the job. Like all jobs of management, the actual necessities involved in the supervision are only part of the work. The opportunities for developing the understanding existing between the men and the company, and among the men themselves, constitute a very important part of the job and a large part of the efficiency. In all the armies engaged in the late war, we paid a great deal of attention to the morale of the men, to their health, to their comfort, and to their team work. In industry, we have been inclined to emphasize the mechanical side of the matter—the process, the materials, the machine—and in the course of doing that, we have looked upon the man as a part of the machinery, so that we have forgotten, to some extent, the effect of his thinking, his desires, and his attitude toward his work and upon the character of the work itself.

The foreman is an officer in the sense in which that term is understood in the best military practice; a comrade of his men, but a comrade of superior attainments and consequently a leader

who understands his men and knows when they need encouragement, and when they need a little discipline, and how much explanation will help in the accomplishment of the work.

The order will be far better obeyed if the foreman and the men understand each other and can believe that the order is worth while even if it is not explained to them. The work will be done still more quickly and more accurately, though, if the foreman and his group can go at it with a common understanding of its importance and its necessity.

A good subordinate and a good officer come out of the same understanding of the job. There can be no team work unless the men believe in the coach, the manager, and the captain, and unless they are willing to take on faith some of the work which they do. The coach, the manager, and the captain must be agreed as to their responsibility and take each other on faith where they do not understand the reason for the methods. Only in this way can they get the team spirit into everybody, so that the team will work coordinately—not like a mere machine, but like a machine might act if each part of it was endowed with intelligence and enthusiasm. With this kind of an officer, the group of workers will go at the job with a combined power that is far greater than the amount of power necessary merely to get by. They will do things with an ease that is astonishing and they will make the work of supervision a pleasure instead of an embarrassing task.

Section IV

The Foreman as Instructor

The Old-Fashioned Foreman. — My friend John Smith was brought up in an old-time cabinet-making shop, where they had apprentices in the old way, and where nearly all the work was done by hand, except the turning. He is a designer of furniture today, and a very good one. He is fond of describing that old shop and of saying that he got all his education in furniture during his apprenticeship in it. Apparently he did not have the opportunity of getting much schooling. A little reading, a little writing, and some arithmetic, plus some geography and history, were about all he received. All his knowledge of fine fitting, workmanship, finishing, and decorating was secured from his practical workdays in the cabinet maker's establishment. The most interesting part of his reminiscences is that portion which refers to the bespectacled old foreman, his skill, his kindliness, and his patience.

"That man knew his business," my friend would say. "He could show any worker how to fit a finer concealed joint, how to carry through a decoration in each part of the piece. He knew how to use tools better than anyone else. Moreover, he was so interested in doing a good job that he not only showed you how to do it, but he made you feel proud of every step you made in advance. I believe I owe most of my skill, and my mental development as well, to that foreman. He not only taught me the furniture business, but he taught

me to do a *good* job, to respect a real job, and to put all my brains and my skill into everything I did. Nearly every man who came out of the old cabinet-maker's shop is in some important position in the furniture business today. That old foreman did a good job of educating and instructing all the boys and they loved him for it."

Educating vs. Instructing.—It is well worth noting that my friend said "educating and instructing." There is some difference between the two, although they ought to go together always. Education is making people *think,* while instruction is showing them how to put that thinking to useful purposes.

That foreman was a great man. He did his bit in the world by turning a lot of young apprentices into practical business men with a *respect* for their work, an honest *love* for their work, and a master *capacity* to see it through.

The foreman is the natural instructor—to very many workers he is the only instructor. Many workmen have had little schooling and much of what they had did not stick. The foreman can make a good workman out of a bad one. He can create a love for a good job, an honest job, and an accurate job of work. To do this effectively he must continue the instruction work which was done by the old foreman in the days of general apprentices, and supplement it with modern ideas and methods.

The necessity for the instruction of the workman has increased because the work has become

so highly specialized. My friend, who learned the business of making furniture in the old cabinet-maker's shop, had a much better chance to get some education out of his work than the worker of today because he used all the tools in the place and made each part of an entire piece of furniture. Yet he would not have been able to take full charge of completing the job without the wise instruction of the foreman and his patient educational influences, born of his pride in his craft, his trade, his job, and the accomplishment of good work.

Methods of Instruction.—The workman who learned so much from the foreman of the cabinet-maker's shop interested me greatly by his stories on this subject. One evening, when we were talking about production and manufacturing subjects, I asked him why he laid so much emphasis on the old foreman's instruction and what was the man's system of managing the matter which had influenced him so much.

He smiled a little at my request for system as he replied to my question. "He didn't have any real system in his instruction," said he, "not a conscious system, although he formed the habit of going through things in much the same way. His shop was not organized the way we have it now. I imagine he could have helped and influenced a great many more young workers if he could have had the advantages of modern organization in his work. But he did have one principle without

which the system would not be worth much, but with which one is master of any system.

"He often told us that no good work was ever secured if the man did not know why the things were done that way and appreciate the reasons. He always taught us why the stroke of a plane should be just so (my friend illustrated this with his hands, but, of course, I can't give you that part of it), and showed us the advantages of it.

"He explained why some joints were concealed and some were not. He went further and told us why some kinds of lumber were good for certain furniture and others were not. He discussed the grain of the lumber and showed us how each had to be worked differently to get the best and most rapid results. Similarly, he told us the reasons for the routine of job records and sheets, time sheets, and other things which seem so much red tape to the young workers. I don't believe he ever gave me an order without showing me the reason for it. He was a true instructor."

Merely Giving Orders Is Not Instruction.— There are many men who think of instruction in business as *ordering* others, but that is not instruction. A great many orders are delivered without there being any instruction with them at all. Unfortunately, many of the officers in the industrial army do not see the necessity for instruction. They think that orders are all the instruction any worker needs.

You know better. You are sufficiently close to the workers to know how much can be accom-

plished by teaching them how to keep the machines in good order, how to manage their work, how to rest themselves with a maximum of effect and a minimum of time. You know that many of the workers have been pitchforked into industry, or their particular job in industry, without any real preparation; and you know how little they understand about the machines they operate and the work they do.

Because *you* know these things and the workers know *you,* you are in a fine position to give them a better understanding of the machine they work at, of the tools they work with, and of the work they are doing. You can show them, bit by bit, many things about the machine or the tools which will be interesting and will awaken their thought.

Part of the job of being a foreman is to instruct the man, not merely on the orders for the day or the job, not merely on the rules, but on the tools, the work, and the reasons for these things. A good workman remains the most important product of civilization. He is likely to be a good citizen, and a good supervisor when he takes that responsibility. The foreman is largely responsible for the good workman in the group under him and, to the same extent, for the poor workman. Instruction is necessary, however, if the poor workman is to advance, and this instruction will not only benefit the entire group, but also will increase the output of well-finished material.

Ask Yourself These Questions and Answer Them

Don't be satisfied with merely THINKING you have the right answer; be *certain* about it. If you are not sure of your answer or the subject is hazy, turn back and read that part carefully.

1. Name the subject of each chapter in this book.
2. What are the four factors which the foreman must combine in production?
3. What is the first responsibility of the foreman?
4. What are some of the problems which the foreman must solve?
5. Name three types of the inefficient foreman.
6. Name some types of the successful foreman.
7. What does the foreman represent?
8. What is meant by "interpreting"?
9. What must you know in order to interpret orders and policies to the workmen?
10. What is meant by "subordinate"?
11. In what sense is the foreman an officer?
12. What is the foreman's job as educator?
13. What is the difference between educating and instructing?
14. What is the difference between giving orders and instructing?

Chapter 2

Part I
BASIC FACTORS IN PRODUCTION

Part II
THE FOREMAN AND PRODUCTION


Idleness of Machines and Men
75%
Goods
Produced
25%

Part I: The Job

BASIC FACTORS IN PRODUCTION

Section I

Utilizing the Time of Labor

Time Is the Vital Factor.—Efficient utilization of time is the vital factor in industry. It is the factor which most deeply concerns the foreman; and it also concerns the workman. If a man decides to improve himself intellectually, he must take time to study. If he wants to get more work done, he must cut down the time required for each operation. The one factor which is common to every kind of work is time. If anything is needed by a consumer, it is needed at a definite time. A man needs coal when it is cold enough to have a fire and his present supply is used up. He needs food when he is hungry and a new suit when the old one wears out.

Working back from the time the article is needed by the consumer, we arrive at the time it is needed by the distributor—taking into consideration the necessity of keeping a certain stock on hand at all times and possible delays in transportation. Working back from the time the article is needed by the distributor, we fix the time when the article should be manufactured, the time when the various parts must be completed, when material must be received, and so on back to the securing of the raw material.

Time runs through every phase of industry like the string through rock candy.

Since the foreman has such an important place in industry it is particularly necessary for him to keep his eyes on the clock and the calendar; and to judge his success by the amount accomplished within a given time.

Where the Time of Labor Goes.—The time of all employes of a shop is spent in three different ways:

A. In useful labor.
B. In useless labor.
C. In idleness.

Useful Labor Uses Time Constructively.—It is evident that the income of any plant is the result only of useful labor. However, the time spent in useless labor and in idleness must be paid for; and, since the income is the result of useful labor, those who are engaged in it must earn pay for those engaged in useless labor and those who are idle. The result is that those who do useful work do not receive full pay for all they produce and are entitled to. If useless work and idleness are done away with, those who are doing useful work can be paid higher wages.

It is the object of any farseeing management to reduce the expense of idleness as far as possible, and to pay those engaged in useful work according to the amount of work they do. The progress made toward this end depends almost entirely on the foreman's ability to run his shop properly. The methods of production presented in chapters

2 and 3 were worked out for the purpose of enabling the foreman to use the time of all the men in his shop on *useful* work. Many foremen have operated their departments by these methods and the results have been to their own advantage as well as to that of their workmen and employers.

Forms of Useless Labor.—Time spent on work which is of no value falls into three classes:

A. Making things not wanted.
B. Spoiling work.
C. Doing work in a longer way than is necessary.

Making Things Not Wanted.—When there is a good deal of work to be done, we want to manufacture *first* the goods which will be *used* first. In order to do this the foreman asks the superintendent's office, when it issues an order, to tell him when this work is to be completed. From the dates given he can easily see which work is of most importance.

However, there are constant fluctuations in markets and changes in demands of customers which make it necessary to alter the dates for completion of these orders. Notification of these changes does not always come through to the foreman promptly; so, in order to avoid the waste of time on work which need not be done immediately, the foreman, on his "Order of Work" sheet advises the superintendent's office each day as to what work he expects to do the following day. This report is given to the superintendent's office

in sufficient time for that office to check it up and advise the foreman of any changes before the work is actually begun.

Order of Work Sheet.—On the left side of his Order of Work sheet (Figure 1, page 55) the foreman lists all the machines in his department, arranging them in groups.

Opposite each machine he then writes down the order or orders he expects to run on that machine the following day. If he expects to do more than one order on a machine, he lists them in the sequence in which he intends to do them. Opposite each order number he writes whatever information is necessary to identify them, such as the part and the operation. If there is more than one piece on the order he shows the number of pieces called for.

On this Order of Work sheet the foreman has shown what he expects to do with his machines the following day, but in making it out he is probably confronted by a lack of specific information as to just which orders are of the greatest importance. He has, of course, taken advantage of whatever information the superintendent's office has given him on the orders as to the dates wanted; but he can never be quite sure that he is running his orders in the proper sequence. Accordingly he makes out three copies of his Order of Work sheet—the first on white paper, the second on yellow, and the third on blue—and sends the *white* copy to the superintendent not later than three o'clock of the day before the work is to be

MR. Black SUPERINTENDENT DEPT. H

TO NOTE HOW MACHINES WILL BE RUN ON DATE Oct. 20

MACHINE NO.	MACHINE CLASS	ORDER NO.	PART NAME	PART NO.	OPERATION NAME	OPER. NO.	NO. OF PIECES	STARTED	RUNNING	FINISHED	REASON FOR NOT STARTING	WILL START
8	DB	2675	Knob	KX	Mill	8	125	‖		‖		
9	DB	2730	Rod	RB	"	6	200				Fixture broken	23rd
10	DB	2701	Handle	HP	"	18	50		‖	‖		
		2680	Rod	RH	"	6	75				No Material	26
		2745	Rod	RK	"	6	90	‖		‖		
508	DP	Down for repairs										
509	DP	2792	Knob	KP	Mill	8	500	‖				
4	DP	2749	"	"	"	"	140	‖		‖		
		2607	Handle	HF	"	18	200				No tools	?
615	DA	No orders										

J. H. White FOREMAN

C11 10M-SETS-10-19 ORDER OF WORK

Figure 1. For explanation see page 54

done. This gives the superintendent's office time to go over the report to see whether or not the orders are being run in accordance with their latest plans. If not, the superintendent's office tells the foreman what changes should be made, and he has time to make them before he begins work the next morning. In other words, the foreman writes down his *understanding* of the proper sequence of work and asks the superintendent to check him up. This makes it unnecessary to take work out of machines after it has been begun, and avoids criticism after the work has been completed.

The *blue* copy of this Order of Work is given by the foreman to his man who supplies materials to the machines—frequently called the "moveman." From this sheet, the moveman gets his day's work; that is, he sees what orders are to be run on the various machines and he brings materials to these machines before the previous orders have been finished. When he delivers the material for any job, he checks it off on his copy, and when he is not able to get the material, he writes the *reason* on the report. Before the end of the day he returns his copy to the foreman.

In the meantime the foreman has given the *yellow* copy to his clerk, who assigns jobs to the workmen. The clerk uses it throughout the day in handing out jobs and checks on it the jobs as they are begun and completed; if not begun, he gives the reason why. At the end of the day, the clerk enters on his copy the information which the moveman has written on the blue copy and

sends it to the superintendent, who can then see how the plan submitted the previous day has been lived up to. Where the plan was not followed he can see the reason why. In this way the superintendent and the foreman are kept continually in touch with each other and in a manner which does not require very much time. If the foreman is not planning his work as the superintendent wishes, mistakes can be avoided instead of having to be corrected at considerable expense after the work is done. It is evident that the foreman can get more advice and help from his superintendent in this way than by handling matters through conversation.

Since a large part of the work of making out these Order of Work sheets is of a routine nature—simply requiring a knowledge of the shop and the work in it—the foreman can relieve himself of much of the detail by choosing one of his best men to do this planning for him and submit it for his approval. He can also delegate much of his other work to a clerk who is familiar with the shop.

The amount of necessary planning and recording depends on the size of the department. In some places the foreman needs no assistants and in others he needs half a dozen; but he should never be so occupied with detail work that he cannot look after his real job of *getting work done.* In this book the foreman is spoken of as doing everything, although he will undoubtedly delegate a part of the work to others.

Avoiding Spoiled Work.—The spoiling of work is usually due to the fact that the workman either does not know *what* is to be done, or *how* to do it. To avoid this waste the foreman gives each workman specific instructions as to *what* he is to do, and he supplements these instructions with such information as may be needed to enable the man to do the work properly—*how* to do it. The foreman, or his clerk, gives the instructions on production cards showing *what* is to be done. Information as to *how* the work should be done can be given in writing, on blue prints, or by men specially skilled as instructors. The most effective results can be obtained through skilled men who can act both as instructors and inspectors. Such men know the standard of quality established by the company. They, accordingly, inspect the work as it comes from the machines to see that its quality is equal to those standards. If the work does not come up to the standards, the inspectors are so familiar with the process that they can tell the operator what mistake he has made and can show him how to correct it. The more frequently the work in process is inspected and the nearer the inspector is to the operator, the less there will be of spoiled work.

Doing Work a Longer Way Than Is Necessary. If certain work is being done in one hour when it is possible to do it in half an hour with equipment already on hand, but by a different method, then that half hour is just as much wasted as if the operator spent it in idleness. It is to the in-

terest of everyone for the foreman to reduce this waste time by using his own knowledge and the knowledge of other people to devise the shortest and most effective methods of getting work done. In thus improving methods, the foreman can exercise his ingenuity to the utmost. It is fortunate that he has at his command such a vast fund of mechanical knowledge as we have in America today. His improvement in mechanical processes is limited only by his ability to accept and apply the knowledge of others.

The Waste of Idleness.—The tremendous waste of productive power in this country through idleness is almost unbelievable. One of our greatest engineers, H. L. Gantt, after years of experience in a variety of plants, said that the equipment of American shops is used only about fifty per cent of the time; and, when it is used, only about one-half of the possible output is secured from it. In other words, the output of American shops is only about twenty-five per cent of what it might be.

The greatest and most important savings which a foreman can make in his own department are through the reduction of idleness. There are two kinds of idleness:

A. Idleness of machines or equipment.
B. Idleness of men.

Idleness of Machines or Equipment.—In his attempt to reduce the idleness of machines, a foreman's first step is to *find out the facts.* Accord-

ingly, he has records kept of when machines start up and when they stop, with the reason for the stopping. From a pile of daily reports of this kind, it is difficult to get a clear idea of the use of his equipment, so he tabulates the facts on a "Machine Record Chart," which is illustrated in Chapter 3. When a group of machines, therefore, are totaled and these group totals, in turn, are added up to get the total running time of the department as a whole, the foreman has a comprehensive view of the use of his equipment which he could not get so well in any other way.

Having convinced himself as to the amount of idleness in his department and having ascertained in each case the reason for the idleness, his job is to reduce it. When the reason for the stopping of the machine is understood, the responsibility can easily be fixed. If the fault is chargeable to the foreman or to any of his assistants, he will immediately take the steps necessary to avoid its recurrence. If the responsibility for the idleness rests on the shoulders of some one outside of the foreman's department, he will attempt to gain the cooperation of the responsible individual or else ask help from the superintendent. In taking such matters up with men outside of his department, the foreman should confine the discussion to specific cases, rather than deal in generalities. In that way permanent good feeling is established.

Idleness of Men.—Most men would rather work than stand around doing nothing. There are exceptions, of course, but that statement will

be generally agreed to. In the case of machines, it is enough to record that they are running or not running, since the speed of the machine or the amount it turns out when running depends upon the man who is operating it.

In the case of a man, however, the mere fact that he is working or not working is not sufficient; we must know the *rate* at which he works. Consequently, the foreman records the *amount* of work done by the man and compares it with what he believes *could be done* by a capable man on a good machine. The foreman gets his record of the amount of work done and the time taken to do it from the production card, and enters it on the "Man Record Card." It is necessary to have all this detailed information written down but it is difficult to get a complete idea of the work of a group of men from these cards. For that reason the foreman has these records presented on a "Man Record Chart," (Chapter 3). This chart shows the amount of work done, while the reason for idleness is also given where a full day's work is not recorded. Cumulative lines show how the work done compares with a full week's work.

Removing Obstacles to Production.—From these charts the foreman is usually surprised to see that the failure of the operator to do work within the estimated time is more often his fault than that of the workman. He learns for the first time how much of the time of the operators is wasted because of the improper sharpening of tools, defects in material which should be caught

by the inspectors, the unsatisfactory condition of machines, and the lack of proper instruction on new jobs. These charts bring home to him very forcibly the reasons why he fails to make good on some of his promises to complete work at specified times.

Where these reasons for the failure of an operator to do a full day's work are beyond the foreman's control, he takes the matter up with the individual who is responsible and attempts to prevent its recurrence. When these obstacles affect the wages paid the man, there are frequent complaints.

Not long ago an operator came to his foreman, saying that when he came to work there he had accepted the average day rate on the understanding that the piece rates were generous, and that he could make twice as much as his day rate if he wanted to work hard enough on piece work. He had been able to do that when there was plenty of work and his machine was in good condition; but most of the time he had made only a little more than his day rate. When he finished one job he usually had to wait hours for the next. His machine was worn out and was frequently down for repairs. Because it could not be kept to close limits, a good deal of the work he did was not passed by the inspector; so, when he had no work or his machine was down, he had to sweep the floor, clean other machines, or do nothing. He did not like that, and besides, it paid him only

his day rate. As a result his pay envelope did not contain what he needed to live on.

This is beyond doubt a common occurrence; but it can be avoided, to a great extent, when the foreman devotes sufficient time to removing the obstacles which prevent his men from doing a fair day's work.

When a sufficient number of instructors and inspectors have been provided and the maintenance of tools and machines has been improved, the foreman begins to show the charts to his workmen—bringing one or two of them at a time into his office. It is surprising how quickly they grasp the idea of the charts and learn to read them. Even foreigners who cannot read English can understand, from the length of the lines, the comparison between their ability and that of the other operators. Some of them may have complaints to make as to the accuracy of the records; but those inaccuracies are quickly straightened out by the foreman, who is as anxious as the men to have the records correct.

The filling of new positions or of vacancies is made much easier by the Man Record Charts. Long production lines show that a man at least knows how to do his work right and has some initiative. From the men with long lines, after careful consideration of the other qualities needed, a sub-foreman is chosen. The lines of the various sub-foremen indicate their ability to get their groups of men to turn out work. When the foreman needs an assistant or somebody to succeed

him when he is promoted, the man is selected from the best of the sub-foremen, as shown by comparing records.

It is a great advantage to the foreman to fill all positions of importance by promoting men already in his employ; this increases the loyalty of the men in his shop, because they know that their work will be rewarded, and also because they see that the management of the shop is gradually being made up of men selected for their proved ability—men who know the work and can get things done on time.

Section II

Controlling the Cost of Production

What Makes Up the Cost of Any Article? The ability of a foreman will be judged, at least to a certain extent, by the *cost* of doing the work given him. He will, therefore, want to know what his work actually costs. The cost of manufacturing an article is made up only of those expenses actually incurred in the production of that article. For instance, the cost of owning a building and the land on which it stands is part of the cost of goods manufactured in that building. But the cost of owning the vacant lot across the street, which is not used for anything, is not a part of the cost of manufacture, even if the land is owned by the manufacturing company. It is an investment to provide for future growth—a sinking fund paid out of profits, and not a part of the cost of the

goods produced. Only buildings and land that are used should be included in costs of manufacturing.

Similarly, the cost of an article must include the cost of owning and housing the machine on which it is manufactured; but it should not include the cost of owning a machine a few feet away, which has been idle and has not in any way influenced the manufacture of that article.

How Cost Is Made Up.—The cost of an article is made up of the following items:

A. Cost of material.

B. Cost of direct labor (wages of the operator of a machine and his helpers, if any).

C. Cost of owning or renting the shop and keeping it equipped and organized to turn out work (sometimes called overhead or burden).

The first two items are easily understood and arrived at, for they are represented by money which is paid out for a definite amount of material and a specific job. The third item is made up of a variety of expenses and must be computed carefully. It, in turn, is made up of four items:

1. Plant cost.
2. Department supervision cost.
3. Machine cost.
4. Power cost.

Plant Cost.—The cost of running a plant includes:

1. Owning or renting the building, distributed as follows:
   a. Interest on investment in land and building.
   b. Taxes on land and building.
   c. Insurance on building.
   d. Repairs to building.
   e. Depreciation of building, i. e., the general decrease in value of the building as it grows older.
2. Insurance on contents of building, employer's liability, etc.
3. Heat, light, and water.
4. Supplies—such as waste, oil, lubricating fluid, etc.
5. Equipment—such as trucks, containers, etc.
6. Maintenance and service, covering the wages of cleaners and truckmen, cost of running storerooms, repair departments, etc.
7. Plant supervision, including salary of superintendent or manager, and the expense of his office.

When these expenses are calculated for a year and totaled, they are distributed to the various departments, usually on a basis of floor area. For instance: If the plant expense for a year amounts to $300,000, and there are ten departments of equal size, it would amount to $30,000 per department.

Department Supervision Cost.—The cost of supervising a department is made up of the salaries of the foreman, sub-foremen, instructors, clerks, and so forth. This might possibly amount to $20,000. It is added to the department cost of $30,000, giving a total of $50,000.

It is evident that material which is standing in a shop is not affected in any way by that shop. It is only when machines are applied to the material that any value is added to it. The plant and the department affect that material only through the machines. Therefore, the plant and departmental cost must be applied to the material or the job through the machines. Accordingly, that expense is distributed to the machines, either according to the floor space they occupy or their value.

For instance, if that expense amounts to the $50,000 mentioned, and there are ten machines all of the same size or value, the annual expense would be $5,000 per machine. If there are approximately 2,400 working hours in the year, the machine hourly expense rate would be $2.08.

Machine Cost.—There is also the cost of owning a machine and keeping it ready for work. This cost is composed of:

1. Interest on the money invested in the machine.
2. Depreciation of the machine, due to age and the progress in mechanical design which will make the machine out of date.

3. Repairs to keep the machine in condition to turn out good work.

If this should cost, on the machine mentioned above, $480 per year, the cost per hour would be 20 cents. Adding this to the $2.08, would give us a cost of $2.28 in order to keep this machine ready to run.

Power Cost.—When the machine is started up, it is necessary to add the cost of power, and sometimes a little wear on the machine. For example: The power may cost 50 cents per hour. Adding this to the $2.28 gives us a total cost of $2.78, when the machine is running.

Total Shop Cost.—We thus find that the total shop cost of any article manufactured is made up of:

A. Material.
B. Direct labor.
C. Expense of owning the shop and keeping it equipped and organized, which in turn is composed of:
    1. Plant cost.
    2. Department supervision cost.
    3. Machine cost.
    4. Power cost.

Relation of Costs and Selling Prices.—There is, of course, a considerable difference between the total shop cost and the selling price of most articles of commerce. If the business is to be successful, the selling price must cover the following items:

1. Total shop cost.
2. Expense of selling (including salaries, commissions, and traveling expenses of salesmen, dealers' commissions, discounts, expense of branch offices, warehouses, advertising, and so on).
3. Administration expense (including salaries of the officers of the company and the expenses of the executive offices).
4. Profit (out of which must be paid interest on borrowed money, purchases of new equipment, buildings, land, development of inventions or new markets, dividends to stockholders, and *the cost of maintaining machines in idleness*).

The foreman will increase his value if he gets a broad view of the business as a whole, for the more he knows about the effect of his work on others the more intelligently he can do his own job.

Machine Rates and Direct Labor.—In the average shop the machine rate amounts to a great deal more than the hourly rate of the direct labor. So much expense has to be incurred to equip and organize the shop, and so many things are done for the operator in order to leave him free to run his machine, that the cost of this service to him is naturally greater than the amount paid him. It is not at all unusual for the machine hour rate to be more than ten times as large as the hourly wage rate of the operator of the machine.

The Value of Cost Records.—The expense of getting accurate cost records is considerable, and

it is not justified unless the records are utilized. Their value to the treasurer of the company is to show him where the money has gone; but that is very small compared with their value to the superintendent and to the foreman. So far as they are concerned, the principal reason for accumulating cost figures is that they may use them as a basis for reducing future costs. In order to make this use of them, the records must be in their hands very soon after the expense has been incurred.

If the foreman works on an order for several days, he wants to know what his production is costing the first day or two, so that he can get it down, if possible, on the remainder of the order. He also wants to know the total cost of that order, so that he can do the work at a lower cost later on, when a similar order comes through. When a foreman makes prompt use of cost records, he realizes, more than he ever did before, that *low wages do not mean low costs*. On the contrary, he learns that low costs are more frequently the *result* of high wages. The greatest savings that the foreman can make are the result of the better handling of his own job by providing economical methods and equipment and by intelligently planning the work of others.

The Cost of Idleness.—In arriving at the cost of running a shop and figuring the machine rates, it will be seen that by far the greater part of the cost is incurred in keeping the machine ready to run, and that the added cost, when the power is turned on, is comparatively small. In the instance

quoted above, it cost $2.28 to keep the machine ready to run, and only 50 cents more to run it. The expense of $2.28 goes on whether the machine runs or not; and for every hour it stands idle the company must pay $2.28 for rent, supervision, and the like. This expense cannot, of course, be charged against the product of any other machine, for it had nothing to do with that product.

Since the machines, equipment, or buildings which are standing idle do not affect the goods produced, the cost of that idleness must not be included in the cost of the goods produced. It can only be charged to "profit and loss."

Idleness of machines is caused by the failure of the foreman and superintendent to keep machines in repair and provide power, tools, material, and operators, or by the failure of the Sales Department to secure orders for work which can be done on those machines. It is obvious, therefore, that in fixing the price of goods produced, if the profit is made sufficiently large to reimburse the company for its losses due to idleness, the public is made to pay for the inefficiency of the management. If much idleness is charged to the public, it will eventually react to the company's disadvantage, because the public will buy from a competitor who charges less idleness to the consumer.

By keeping the cost of goods produced as low as possible, and by eliminating idleness and wasted effort, the foremen of any plant have greater

power to influence the profits of a company than the men who purchase the material or who sell the product.

Section III

Maintaining the Quality of the Product

Relation of Quality to Time and Cost.—In order to sell the product of a plant, it is necessary to have a definite *standard* of quality. This standard, or grade, is determined after considering the needs of consumers and the probable cost of production. The foreman accepts this standard of quality, and his job is to turn out goods of that grade at a specified *time* and at a *reasonable* cost. Anyone can do work of a specified quality if he *takes time enough to do it.* It is not so easy when time and cost must be considered.

What Influences Quality.—The quality of goods produced is largely affected by four things:

1. Attitude of workers.
2. Working conditions.
3. Equipment and machines.
4. Inspectors and instructors.

Attitude of Workers Affects Quality of the Product.—The effect of carelessness on the quality of output is known to every foreman. To prevent this carelessness, the attention of workmen must

be directed to the quality required; and it must be made to their advantage to turn out goods which are up to that standard. The actions of ninety-nine out of one hundred men are determined by a more or less intelligent self-interest. In dealing with men, the wise foreman does not blind himself to that fact. Since he wants good work, he makes it to the financial advantage of the workmen to turn out good work.

Working Conditions Affect Quality of the Product.—A workman is consciously or unconsciously influenced by the amount of light he gets on his work, the ventilation of the room, the chair he sits on, the convenient placing or arrangement of his machine or workbench, and the cleanness of the walls and floors. In fact, his whole surroundings are reflected in the work he does. In a shop where things are kept in good order, and the routine of the department goes on quietly and methodically, the man can keep his mind on his work. He will make fewer mistakes, and do work of a better quality than in a shop where he is continually falling over things left on the floor, and is disturbed by frequent arguments and petty annoyances.

Equipment and Machines Affect Quality.—The work done in any shop is affected to a considerable extent by the condition of the machines on which it is done. In fact, a high quality of output cannot be maintained when poor equipment is used. There is a point in the life of any machine where it is more economical to get rid of

it than to use it. The foreman of any shop, no matter how large or how small, will find it worth while to study the needs of his shop, to provide the best equipment consistent with economy, and to see to it that his equipment is properly maintained and used to the best advantage. The more attention he gives to this subject, the better will be the quality of his output.

Functions of Inspectors and Instructors.—Inspectors frequently understand that it is their duty merely to *detect poor work.* Better results can be obtained if they understand that their function is to *help operators turn out good work.* That gives them a positive and constructive object, instead of one which is negative. If the inspector is, at the same time, an instructor and can, not only tell the operator that his work is not up to standard, but also show him where he made his mistake and how to avoid that mistake in future, he becomes a much more useful person. In doing that, the inspector secures a degree of cooperation and a reduction in the waste of material and time which are not possible when he has no responsibility except that of inspecting worked material.

Increasing the Productivity of Slow Men. The Man Record Charts, which are given in Chapter 3, show how much good work each man does in comparison with the foreman's estimate, which has been made after taking into consideration time, cost, and quality. The foreman knows that he is judged to a great extent by his ability so to run his department that his men can produce

a fair day's work and that it is to his advantage to help those who keep the average down. He realizes that the idler and the slow worker are more in need of help than the good worker. Accordingly, the foreman shows these charts to his workmen with the idea of developing their ambition and a spirit of rivalry among them. He soon learns, however, that the long production lines of the two or three men who are head and shoulders above the others seem to have little effect on the average workman, but that he is very strongly influenced by the lines of the men he considers his equals. He hates to be beaten by an equal and will do all he can to keep up with him.

There are some workmen, however, who cannot measure up to the average and do not respond to the foreman's effort to stimulate their ambition. These are the men he studies most carefully. Even without records these men know whether they are better or worse than those around them, and they resent the introduction of methods which make this fact evident to the foreman and the other workmen. Those who have, in the past, tried to cover up their low production by attempting to stand in with the foreman and can no longer do so are opposed to these records and do all they can to undermine their usefulness.

Experience has taught the foreman that men who feel their inferiority are very apt to do everything possible to distract the attention of others from that inferiority. This frequently shows itself in flagrant breaches of shop discipline or in

creating discontent in the minds of others. In this way they secure an outlet for their energy and distract their own attention, at least, from their inferiority.

When the foreman studies the records of these men who have short lines on the chart, he realizes that they are usually the backbone of strikes and discord in his department. Their consciousness of inferiority and their discontent are continually smoldering and are easily fanned into flame by some fancied grievance, some real injustice, or some capable agitator. The foreman who wants fewer labor troubles in future realizes that he must solve the problem of what to do with these men who are below the average—whose lines are short on the chart. Shall he drop them from his payroll and ask the Employment Department to hire others to fill their places? He knows that the available supply of good workmen in most cities, except in times of business depression, is inadequate and that those hired will probably be just as poor as those discharged. If he spends an hour in the Employment Department watching the applicants, he will see that they are made up largely of men who have never learned to do any job well—men who have been discharged from other jobs because the quality of their work has been poor and their production low.

Discharging the inferior workmen in his department will merely add to this mass of floating labor. The foreman who is looking into the future will not discharge these men; he will try

to train them to do at least one job well. The foreman tries these men out on various kinds of work until some job is found on which they can do better work than on others. On that job a man is given special instruction, so that no matter how long it takes to bring him up to the average, there are always sufficient instructors to help him. If there is no work in his own department for which one of these men is fitted, the foreman asks another foreman if he will not try him out.

This method of handling short-line men appeals to the foreman's sense of fair play. He is giving these men, for once in their lives, a real chance to make good. When these men, who formerly had short lines, get to the point where they are turning out a full day's work, week after week, they have almost invariably forgotten their discontent, and some of them even show an awakening ambition to work with the team.

Part II: The Foreman

THE FOREMAN AND PRODUCTION

Section I

The Foreman and the Operations

The Worker as an Individual.—The individual worker is first of all a human being. That seems so obvious as to be almost unnecessary of mention; but we have not acted as though we thought so in industry—not always, anyway. The worker, being a human being, reacts as an individual. He tires in a different way from the next man. He gets his speed up at a different rate. He gets sick from different causes and with varying degrees of frequency. He thinks differently, his home necessities vary, he chooses his friends for different reasons, and buys things in his individual way. He may view food as do all the other workers, but he wants to choose it differently and eat it at different times. He may wear clothes more or less like those his fellows wear, but after he has worn them a week they are different. Each individual worker is a complete individual in himself with his own reaction to the work, the place, and the problem.

One man comes to me and says that he is very discouraged about his place, the floors hurt his feet, the work is not interesting, and he stands in a draft. Another says he likes the work but it affects his eyesight. Another enjoys the place but

would like to change his work. Each man acts according to his nature as an individual.

Men sometimes act together and manage to agree upon a limited number of things they can do in common and for a certain period, but they are not alike and their differences must be recognized as well as their common agreements. Every man demands recognition as an individual and he will become restless, discontented, and dissatisfied when he doesn't get it.

The Foreman's Opportunity with the Individual.—To treat every individual as he should be treated and, at the same time, arrange an organization in which these individuals can work together without too much confusion constitute the big problem of industrial organization today and for the next generation or two. The foreman has a far greater opportunity to do this than any of the other supervisors and managers. The number of men in his group is not large. It is an easy thing to get to know them. The worker and the foreman can talk more intimately than any others in that plant. Consequently, the foreman knows which man needs a lot of information to keep him happy, he knows the one who will take things on faith, he is acquainted with the joker and the grouch, the quiet and the talkative ones. He knows, moreover, whether these surface indications show the real man or are only cloaks or shells put on to conceal the actual man during the working hour. He can act with each man accordingly. He can grant to each man in his group

that recognition as an individual which every human being wants and which every human being has a right to expect.

We must find a way to recognize the individual without losing our capacity to work together to the same purpose. There is no man in the industrial organization as capable of aiding in the solution of this big human problem of industrial growth as the foreman. The foreman, with his small group looking to him as a man of superior skill and capacity in their trade, and consulting him on many business and personal matters, can recognize the individual properly. He can see the need for individual treatment and consideration, and he knows the necessity of cooperative work.

The Educative Value of Work.—We are inclined to look at the work we undertake as comprising merely the mechanical or physical operations for which we are paid and the immediate mental demands which are concerned with that same work. It is not very often that we view work in its most important sense; that is, *as the great educator and developer* of men—the only educator for millions of workers.

Every man's job occupies a large part of his waking time. It must be worked out day after day with its problems of one kind and another. From the time we leave school until the time we pass away, the working world claims a large part of every day's thought and a large part of every day's physical energy. Not only that, but the

character of the work itself has its effect upon the habits of the man.

The character of the surroundings, whether they are clean or dirty; the kind of work, whether it is pleasant or otherwise; the kind of product, whether it be something belonging to a live necessity or something cold and dead—all influence us. The mental outlook of the men who work in a factory where the windows are clouded with dirt and thick smoke is affected by these continually disagreeable features. The men who work with products that are pleasant to deal with are affected favorably by those products.

I suppose the coldest and deadest job must be making coins in a mint, because coins are of no value in themselves. They are good only for exchange and they are not used for any creative purpose, but simply passed around from hand to hand until they are worn thin by the handling and must go back to be remelted.

It is not so much in these things that the effect of the work is important, but it is in the continuing mental stimulus that comes from the occupation. The intimacies of human association grow out of our occupation and the problems of our lives are all affected by the conditions of the occupation.

A Man's Work Is His Life.—Because the work is bread and butter, home, family, safety, and all those things, everything connected with work is important to the whole family. Is it plentiful or scarce? Will the individual man like it sufficiently to stay at it? What effect will it have on his

health? The companions he secures because of his work, the possibility of advancement through his work—these are the interesting topics of conversation in all families and among all groups of workers.

Work is not merely the machine at which I am earning a living, or the typewriter which carries the woman beyond the rent day, or the pick and shovel with which another must do his bit. Work is the great educator for most men. It is at work that he learns to apply the little knowledge he remembers from school days and he begins to have some idea of its usefulness. Whether he knows it or not, the work which he is doing every day—because it is so important a part of his life—affects his habit of thinking and his habit of acting, educating him by the force of its necessary demands upon him and his dependence upon it.

Work, therefore, governs the most important associations in the worker's life. If the work is limited and monotonous, the man will have a tendency to view everything from a narrow standpoint. If nobody pays any attention to him and he is considered a part of the machine, he will begin to see life from that point of view. If he doesn't understand the work and no one helps him out, he will not be likely to understand the broader relations of his life.

Work will teach him anyway—good or bad—so the good can be increased immeasurably if the jobs are interpreted to him, the meaning of the work shown to him, and he is taught the reason

for organization and its value to him. Work is our teacher. Whether it turns us out better men depends largely upon the companions we have to meet in our work, the patience of those who teach us our work, and the sympathy and tact of the men who govern that work. Good management can make work a greater and more liberal education for all workers; and the foreman is the man who has an enviable opportunity as well as authority so to regulate the work that the worker will get full educative values out of it.

Section II

The Foreman and the Operators

Know the Worker Apart from His Job.—Although work is the greatest educational factor in the life of most men and intimately affects the whole viewpoint of each man regarding society, government, and his neighbors, the man rarely shows his whole desire or his whole nature at his work. To know him as a man it is necessary to know him outside of his operations in the shop, the factory or the yard. There are many things which may sting him internally that will not come out in his conversation until he has put a safe distance between himself and his work. There are many things he can do which his work has not given him an opportunity to try out. These things all affect his attitude toward his work.

I am acquainted with a company which has spent a good many years trying to get the point of view

of the workers by giving them an opportunity to express themselves, in order to find out if the work can be made a pleasure as well as a source of living for them. There was in one of the shops a man of Polish birth, who was accounted a radical and rather a fair agitator. Several times he had been reported as the originator of trouble. He was spoken of as restless and discontented. The man in active charge of the workers' meetings decided to talk things over with him. It was a difficult job, for the man was suspicious to the last degree. He did not believe in the company and he had been given a bad name which he felt was unjust. He therefore had a grievance and was inclined to nurse it.

Finally, the man who was in charge of the workers got pretty well acquainted with this so-called radical and they talked together a great deal. A representative of the management visited the man's home and found out that he spent most of his evenings studying a correspondence school course in mechanical engineering. Sometimes he felt that he was getting along all right, but the difficulties of the lessons made him thoroughly discouraged. The trouble was that he did not have enough public school education as a foundation. He was of an active, restless turn of mind, impatient with obstacles and very desirous of progress. The difficulty of advancing in his studies had soured his disposition and induced him to become one of a body of radicals—restless people like himself.

The representative of the management took it upon himself to act as this man's adviser. He found night schools in which he could receive instruction. He took an interest in the man's progress. Now, this former radical is a representative of the workers at the shop committee meetings. He is a believer in the company and he is going forward in skill and usefulness. It was not until the representative of the management got to the man outside of the shop and made a friend of him that he found out what the trouble was and how to solve it.

A company in New York state found out that a good many accidents occurred to the workmen who had sickness in their families or some other domestic difficulty. They were thinking about their troubles at home and that was the cause of their inattention to work.

These instances could be multiplied a great many times; and each case would show that the particular circumstances of the man's social life and matters connected with his home or his surroundings are more frequently responsible for restlessness and misunderstanding than the dislike for his work.

We are constantly saying that lots of men are misplaced in their work. They are doing the kind of work which is not most agreeable to them because they happened to drift into it and have been unable to find a way out. But you are not going to find out what a man would like to do and what he might prove very capable of doing unless

you *know* the man apart from his work. The average man is not inclined to tell you about these things unless he is pretty sure that he will not be laughed at and that his confidence will be respected. So the *man-part* of the worker is always more important than the *work-part,* and it is a more difficult part to understand. Nevertheless, the man's skill as a worker and his value in his work are dependent upon his thinking and feeling as a man—his ambitions, his disposition, his home surroundings, and his economic circumstances. The foreman must know his workers as *men,* apart from their jobs.

The Wonders of Mechanical Operations.—Not long ago, an engineer, who has traveled all over the world and delved into the mysteries of different industrial developments, said he hoped that some day a writer would arise who would be able to show us the romance of industry; that the way in which all these different processes were developed in order to make a nail, or a shoe, or an automobile more quickly and for less money than they were made before would make material for a story more entrancing than the best novel written.

To me, the factory has been at all times a wonderful place. Although I have worked for days at a time at machine operation, I have never been able to get over the sense of wonder at the mechanism which takes a piece of metal and performs a half dozen simultaneous operations on it,

with an accuracy that is more than human and a speed that is surely uncanny.

I have stopped many times in a textile factory just to see the mechanical fingers come down and pick up the thread ends and tie them together; and it has always interested me to stand beside a collating machine in a book bindery and watch its fingers pick out the groups of pages for the book and put them one on top of the other, according to their order, so that they could be put into the binding machines.

Whenever I pass the New York Herald Building, with its big glass windows permitting a full view of the press room, I am sure to find an interested audience watching the paper entering the giant press at one end and coming out at the other a complete newspaper, printed, folded, and counted. These processes are wonderful; and they are wonderful because the thought and intelligence and good workmanship of so many thousands of men have gone into building them efficiently.

Sometimes the things we work with become so familiar that we forget that they are just the product of the brains and skillful workmanship of men, and that few things are useful until transformed by the intelligence and the skill which man can put upon them.

We Are Heirs of the Skill of the Ages.—Your part of the process of making a useful article and making it more efficiently—no matter whether it be the better unloading of cars, the more skillful

handling of machine operations, the development of weaving, or the more accurate and careful attention to sewing—is part of a wonderful co-operative process of making useful things which has evolved out of the knowledge, the study, and the patient work of thousands of other workers who came before you.

It is not enough to know the *man* who is working in your group as a man; you should also know the processes which are undertaken in the group over which you have supervision. They are part of the technical requirements of your job. They are a little more than that, however; they are a part of the human story of the industry which is being developed by scores of other workers operating in just such cooperative groups and adding their wonderful bit to the amazing total of the story itself.

If the worker who is operating a machine could understand the intelligent study which was put upon the design by the engineers who, one after the other, evolved that design; by the workers who made the machine and added their skill to its manufacture; by the workers who used it and discovered where it was strong and where it was weak—they, themselves, aiding largely in its development by their own experience in handling it—would he not be interested?

If the man who operates the machine understood all these things, the machine itself would be more interesting and the work which he is doing upon it would be more valuable in his eyes. Here

are some things which you can do as foreman. Get each worker interested in the tools with which he has to work, and the kind of labor which went into their manufacture. Get him interested in the examination of the tool as he uses it, so that he adds his valuable suggestion for its development. You can stir him to a love for craftsmanship, a pride in his job, and an understanding of its value, when well done, because every process in modern industry contains the story of patient study, careful development, and thorough workmanship by thousands of men, the result of whose endeavors is placed at the service of the worker when he uses the tool for his own operations.

Every man in every industrial establishment is a debtor to the work of thousands of other men for his operative conveniences and tools; and his part in the process of developing new tools and implements makes other men debtors to him.

Section III

The Foreman and the System

Obligations of the Group.—If Smith makes up his mind to build a little bungalow in the woods and to do the job himself, from the cutting of the lumber to the finishing of the proposition, he can work on his own time, begin when he feels like it, and quit when he is ready. Nobody will have any kick coming about the whole thing. But if Smith and Brown and Jones decide to build a

bungalow for their own common use they will have to work together. They will have to get together and decide which part of the work each will perform and they will have to stick to their respective parts of the work. They will be obliged to say when they will work so that the job will be kept going in proper order, and they will be obliged to agree when to quit work; otherwise, confusion and discord will arise. Brown, let us say, is doing the hauling and Smith is cutting the lumber. Brown decides that he feels like working this morning and goes around to haul the lumber, but Smith has decided to take a day off and no lumber is ready. Before very long, under those conditions, there will be a fight and no useful work will be accomplished. There will be no bungalow.

So long as each man made every part of the product as an individual, he could do the work in his own home, could work when he felt like it, and get the job done when he was ready. That method was very slow, so slow that it was able to support only a very small population. There were no conveniences because they were so hard to make. Just as soon as men discovered that they could work faster and better and provide themselves with more conveniences by dividing up the work, it became necessary to arrange this division so that there would be no confusion.

Modern Industry Makes Group Work Necessary.—The progress of industry has brought us to the point where the very demands of our own

conveniences make it necessary for us to work in groups, with a general system provided for that work, so that the work can continue in an orderly manner without confusion and without unnecessary expense and difficulty. The systems which we have in industry today were not planned from the beginning, on paper, for the theoretical determination of the work. They developed gradually as industrial establishments grew large. They were found to be necessary to avoid the confusion that began to creep in when the larger establishment tried to operate along the lines that had been valuable for the smaller plant.

The development of the group was absolutely necessary to modern industry. You and I could not enjoy any of the modern conveniences if we did not confine ourselves to a certain definite group of workers and depend upon the other groups to do the rest of the work. Of course, that means that we must work with the other groups if we are to have all the conveniences we should have and avoid extra cost and hardship. Just as soon as some of the groups quit work or do not work at the same time that we do, we get into the same difficulty which hampered Brown and Smith in building the bungalow.

Your little group is just as important as my little group, because both of them are necessary to the building of our bungalow. You may think that my work is less difficult and more agreeable than yours, just as Smith might have argued that Brown had a cinch in comparison with him; and

I may be inclined to think that you have an unfair advantage of me; but we must group ourselves in some way or other, and we must continue to operate in these groups, otherwise we cannot keep the stream of necessities flowing to the places needing them—the home, the business, the community.

Standardizing Group Work.—The development of the group specialization meant, of course, the development of group operation. The same necessity runs through the group operation that runs through the group organization.

Suppose we go back to the bungalow which Smith, Brown, and Jones decided to build for themselves in cooperation—Smith was to do the cutting of the lumber and Brown the hauling, you remember. After these three fellows started work, Smith found out that Brown could haul twice as fast as he could cut, so he demanded another man to help do the cutting. Jones, who was shaping the lumber and fitting it, found that he could work only one-quarter as fast as Brown so he wanted three men to help him. Smith and his man then would be employed on group work, and Jones and his three men would be on group work. Not all of the men in a group would be doing exactly the same kind of work, perhaps, but all would be doing work which fitted into a definite group of operations. Here is another example:

In a chemical mill certain minerals are ground, pulverized, and packed in bags direct from the pulverizers. There are six distinct operations in the process of packing, viz.: opening the bag, fix-

ing it on the mouth of the pulverizer, filling it, removing it, fastening it, labeling it. There is one man to each operation for each mill. These men are occupied in group work; for, although each is doing work different from the others, all are related so definitely to the packing of the product that they must be handled as a group.

The foreman is the supervisor of group work and the group work is the essential feature of co-operation in the development of modern industry. All group work must be conducted by the group under the same system, the same regulations, and the same standards if it is to be worth while. The group would be just as slow and inefficient as the old method of individual work if it were not standardized. It is the arrangement of the work with the same standards, the same systems, the same methods of recording, and the same valuation which makes the grouping practical and free from confusion.

The unit piece of work turned out by the individual worker is dependent in value upon the group work. In packing the product in the chemical mill, for example, if the man who fills the bags does a good job, the other five men in the group must do an equally good job in their special operations in order that the completed job may be good.

Benefits of Group Work.—So, first and last, the foreman must govern the standard of group work, both in quality and speed. The workers instinctively know this and the tendency is for

the most rapid workers to lower their pace to the group average. It requires less effort on the part of the workers, and even of the supervisor. It is a much harder job to bring the whole group up to the requirements of the more skillful than to let down on those requirements. Standardized group work calls for more patience, more study of the men, and more education on the part of the foreman. It is apt to be discouraging because of this, and so it is sometimes neglected. But, adequate production of the things we need depends upon the development and coordination of group work in industry.

A group of men working together, in the companionship which comes with common working problems, can swing work through with a capacity that is impossible in the lone individual. They can develop a group spirit from the group work which will give them greater power for accomplishment. To do this they must appreciate their dependence upon one another; make use of the ways in which they can benefit each other; and rightly estimate the value of the work they are doing in the group to which they belong.

If the best results are to be secured in production, with harmony and efficiency, the worker must understand that group work is the means of bringing those results to pass. He will then also understand that group work is the reason for group organization, and that group organization works for the benefit of the group as a whole and for

each individual in it. The foreman is the one man who can rightly organize and supervise the group. In doing that he serves, not only the group and its members, but also himself.

Section IV

The Foreman and the Work

What the Job Means to the Foreman.—The job to the foreman means two things, viz: the job which the worker must perform under his supervision, and the job of supervising the work. Very often we think of these as one and the same, but they are not the same by any means. The job which the worker performs is the *physical* side of the matter. It may be unloading cars, shipping products, turning shafting, weaving cloth, sewing garments, or a thousand other things in the wonderful process of useful manufacture. The job of *supervising,* however, means, among other things: understanding the workers, knowing how to keep them contented, interesting them in their work, instructing them in their need for skill, interpreting to them the organization and its policy.

Stated in that way, the job of supervising is quite an important matter, since it offers abundant room for study and plenty of room for the exercise of intelligence. Your group may be a large one and my group may be small; but, after all, industrial improvement depends quite a good deal upon how much understanding and intelligence you

and I put into the matter of knowing the group under our supervision and how much faith that group has in us—whether the group be large or small.

Some years ago, a small advertising agency was run by one of the able men in that line of business. Compared with concerns of the same kind today, he ran a very small place. Not more than fifteen people were employed in his offices at one time, whereas three or four hundred are to be found in some of the present-day establishments. The other day, a group of advertising men were discussing this particular man and figuring out what had happened to his employes. They got a sheet of paper and wrote down their records. When they were through it was discovered that 90 per cent of those employes had made successes for themselves in advertising, and most of them were heads of establishments much bigger than the one which trained them.

Our Job Is as Big as We Make It.—It is a pretty big job to understand a small group of men and work with them so that they like to work in that group; so that they become skilled in their work and trustworthy in their discharge of responsibility. It is the especial privilege of the foreman to be so close to his group of workers that he can influence them greatly, both for their own improvement and for the betterment of the work. This is the vital part of the job of foreman.

One of my friends went through the Great War as a private. Not long ago he introduced me to the sergeant of his squad with great pride. He spoke of that sergeant afterwards in such a way that I became almost envious of the man who was so skilled in understanding and instructing his fellowmen that they would pay such a high tribute to his character. The general may have secured more fame, but I do not think that any general won as much affectionate respect as was shown to that sergeant by his men. It is this intimate and affectionate respect which can exist between the foreman and his group, and it represents the great reward which can come to the supervisor who understands how to handle the human relations in his job; and the job itself is only as big as our ideas of it.

The Bigness of Your Job.—So far we have been trying to see the relation between the foreman and the productive effort which finally accomplishes the useful work of industry. What does all this mean? It means that the foreman is the point of contact between the actual work and the planning, the system, the factory management. The designing department can plan what is to be done and how, the factory management can arrange the tools and equipment, the officials can develop the system and the grouping—all these things must be done and continually done; but they are of no avail unless the work is smoothly carried out and supervised with good judgment and intelligence.

Make no mistake—the brains and intelligence of these other departments of management are part of the great work of keeping these useful industrial processes moving. They furnish the strategy, the definite plans, and the operations by which normal workers may have employment in the actual making of the product. They must not be belittled nor misunderstood. Their work is vital. Let us remember, also, that each group in industry depends upon all other groups. No one group can do the whole of the work required in the process of making useful products, and the groups which are under the supervision of the foremen are doing their part in the actual making of the product in its physical form. This means that the small size of the group under the foreman's charge and the intimate cooperative character of that work enable the foreman to exercise an influence inestimably important in the relation of the man to the job, the worker to the work, and the team to the team leader.

The job of being a foreman has many difficulties, and no man can say that it does not require brain power, intelligence, and understanding. All these are necessary, but the good will and confidence of the men furnish the greatest satisfaction which can be secured from such work. No part of your job is unimportant. Every let down in efficiency, every grievance, every disturbance interrupts the work of production and compels society to pay more for your product with less money to pay with. Not only that, but the worker de-

pends upon the supervisor of his work to such a degree that foremen have in their hands the power to improve the condition of the worker more than any other single group of men.

It Is Easier to Lead Than to Drive Men.—A man who has never had a strike in his plant, in thirty-five years of operation, said: "It is comparatively easy to drive a horse with harness, blinders, and a whip. A little technical skill in holding the reins, some patience, and knowledge of the animal's nature will make a good driver. It is a different matter, however, to lead a horse without a bridle or harness or whip. The horse must know you and have some real regard for you before he will follow you. There are many thousands of men driving horses, but there are very few men leading horses, even with a halter.

It is comparatively easy to *drive* a group of men, when they are afraid of losing their jobs and don't know where to get others. It is not so hard to keep men engaged in their work if you know when the work is well done or not well done, and if you know how to establish such a confidence and respect that they will work for you with all their interest, their might, and their intelligence.

A foreman may be a *foreman* if he knows the work and does not entirely neglect the worker; but he can be a *leader* of his group, getting their full cooperation, if he understands the men, is patient with them, and develops their faith in his squareness and sincerity. That, after all, is the great job of being a foreman.

Questions for You to Answer

1. State the three ways in which *time* is spent.
2. What are the forms of *useless* labor?
3. Describe an Order of Work sheet.
4. In what two ways can the foreman reduce idleness?
5. How is the cost of an article made up?
6. What items must be included in the cost of running a plant?
7. What items must be included in the selling price of an article?
8. What are the causes of idleness of machinery?
9. What four things influence quality of product?
10. Name the educative values of work.
11. Why should you know your workmen apart from their work?
12. Why is group work necessary?
13. Name some benefits derived from group work.
14. What are some of the opportunities given to a foreman who rightly manages his job?
15. What is your judgment as to leading or driving the men who work in your group?

Chapter 3

Part I
METHODS OF GETTING PRODUCTION

Part II
THE FOREMAN AND LABOR

Part I: The Job

METHODS OF GETTING PRODUCTION

Section I

Getting Things Done on Time

How One Foreman Woke Up.—As he closed the door behind him, Frank Skinner gave a sigh of relief and said to himself, "It's too bad, but it had to be done." Three strides took him from the door to the window and he stood there looking out. Skinner was the foreman of a good sized department and this was his office—at least he called it his office although his men referred to it as "the cage" because it was only a space seven feet wide by ten feet long surrounded by "chicken wire."

Skinner had just fired Tim McQuade and was rather pleased with himself for not losing his temper; but as he looked out of the window he realized that, although he had stood for a bawling out without getting mad, he had done the thing he had no intention of doing—he had fired a good man.

Tim McQuade was a good lathe hand and thoroughly used to the work, but of late he had been discontented and grouchy and the men around him seemed to be discontented too, largely due to his influence.

As Skinner went to the other end of his shop this particular afternoon, hunting for some ma-

terial that could not be found, he had run across McQuade sitting on the window sill talking to two other men and smoking a cigarette. There was a strict rule against smoking in the shop, and he had given McQuade a piece of his mind. McQuade had come back with such a jumble of complaints and sarcastic criticism that Skinner had fired him, knowing that if he listened three minutes longer he would knock him down.

For the next two days Skinner thought a good deal about Tim McQuade and sorted out his jumble of complaints into their logical order, which was somewhat as follows:

Tim McQuade had been transferred from another department where he had been turning out work of a fairly simple nature; there had been little trouble with it and he had been able to make pretty good wages. Because he was considerably above the average man in ability, he had been transferred to this department and given much more difficult work. The piece rates were generous and he would have been able to make much higher wages than in the other department if it had not been for the things which prevented him from doing a full day's work. He could not get his cutters sharpened properly or keep enough of them on hand; he had to spend a good deal of time going back and forth to the tool room. The foreman of the tool room of his own department had become so used to McQuade's complaints that little attention was given to them. Some weeks his jobs were so short that he spent almost

half his time setting up his machine. He had often asked for a man to help him on set-ups but there was no one available. He spoiled some work because he had no gauges and a good deal more because his machine was so badly worn that it could not work to close limits. For the same reason he could not take off very much material at a time, and some jobs took much longer to do than they should. His machine was frequently down for repairs and the repair men were so tired of attempting to patch up a worn-out machine that they put every possible job ahead of it. Much of the work McQuade did was special and it took a good deal of time for the office to issue orders; as a result he was frequently idle while he waited for the orders to come through or for material to arrive.

When his machine was down for repairs or he was waiting for tools, orders, or material, he had to sweep the floor, count parts, or do nothing. He considered sweeping beneath his dignity and, when he was idle, he bothered the other men around him. When he was not operating his own lathe, he was, of course, paid only his day rate and, as a result, his weekly wages were too small for him to live on. McQuade had a wife, and three children he was trying to keep in school; rents were high, food was expensive, and clothes were almost prohibitive. He was discouraged with the struggle to make both ends meet and evidently sore at the foreman who made it impossible for him to make a decent living. He was not a well-educated man and could not place the responsi-

bility where it belonged—all he did was to blame his "boss" for everything. This particular day he had been waiting for three hours for something to do and, as he sat on the window sill talking to two other men, he had lit a cigarette; just then the foreman had come along and given him a "call down," and he had lost his temper, spilled out all his grievances, and had been fired.

Skinner turned over this matter in his mind and looked at it from several angles. Here was an operator who had not been kept busy and yet his department was falling farther and farther behind in the delivery of the particular kind of orders this man had been working on. The superintendent had also been telling Skinner that his costs on this kind of work were higher than they ought to be. He singled out the reasons why McQuade had not been kept busy. He recalled that on several occasions the material had not come through from the storeroom or some other department at the expected time; he had had a good deal of defective material which should have been discovered by the inspectors; he had been idle when his machine was down for repairs and while he waited for orders. The more he thought about the matter the more he realized that a great part of the responsibility for McQuade's discontent was up to *himself*, the foreman. Did he have a shop which guaranteed fair play and equality of opportunity? A week ago he would have said "Yes," but McQuade's temper and the outcome had put a doubt in his mind.

A few days later Skinner made up his mind that he would run his department so well and see that his men were so fairly treated that there would be no reason for the discontent which every now and then showed itself. There were many things with which he was not satisfied but which he had let go because they had always been done that way. Now he determined that he would get at the facts about his shop and not guess at things and that he would not be satisfied with anything but the best methods. He, therefore, developed methods of getting work done on time and to the satisfaction of his men and the management. Those methods are given in this book.

The Chief Responsibilities of the Foreman. When a foreman takes charge of any part of a shop he accepts two chief responsibilities:

1. To fill his orders as rapidly as possible and in the proper sequence.
2. To operate, as far as possible, every machine when there is work for it to do.

By the word "machine" is meant whatever equipment is used to do the work. Where there are no machines it is the foreman's responsibility to keep his men busy whenever there is work for them to do. It is not easy for the foreman to realize the importance of these two responsibilities; and, when he does realize their importance, he is confronted by the fact that frequently he is not given information about his orders with suffi-

cient exactness to enable him to get them out in the proper sequence. Moreover, in many plants there is no mechanism by which he can plan the work for his machines so that he may know with certainty, any day, whether or not the machines will be operated the following day.

The first step the foreman takes is to find out exactly how much of the time his machines are running. Of course he remembers what machines have been down during the last few days; but he cannot recall, in many cases, how *long* they were down or why. He needs accurate information presented to him so clearly that he can grasp the facts in regard to his department as a whole.

Daily Idle Machine Report.—The foreman has one of his assistants walk through the department each morning, soon after the shop starts up, and note down on a *Daily Idle Machine Report* (see page 109) the numbers of the machines which are not running, with the time shown under the "reason why" they are stopped. Later in the day, when a machine starts up he shows the time in the column headed "Started," and when other machines stop during the day he adds them to the list. This is a very simple record to keep; in fact, it is so simple that it does not help the foreman to visualize his shop, so he has the information transferred to a chart.

DATE Oct. 8, 19

SHIFT Day

DEPARTMENT Finishing

MACHINE NO.	STOPPED							STARTED
	SET UP	NO HELP	NO MAT'L	NO ORDERS	NO POWER	REPAIRS	NO TOOLS	
971				7 30				10.45
142							9 30	11 00
921		7 30						
601						7 30		9 00
715			8 45					
153				7 30				1 00
152				7 30				
151		7 30						1 00
143				7 30				
587						7 30		
589							10 15	1130
140				7 30				
944				7 30				
759				7 30				
924				7 30				
155				7 30				
981		7 30						1 00
122						10 00		

DAILY IDLE MACHINE REPORT F. Naylor Foreman

Figure 2

Machine Record Chart.—Since *time* is the most important consideration in running a shop, and is the one element common to all work, the foreman has a sheet ruled by hours of his working day or week. If he works an eight-hour day, he has each wide column, which represents a day, ruled off into four narrower columns, each representing two hours. If he works a nine-hour day, he rules the day off into four wide spaces of two hours each and one narrower space representing one hour.

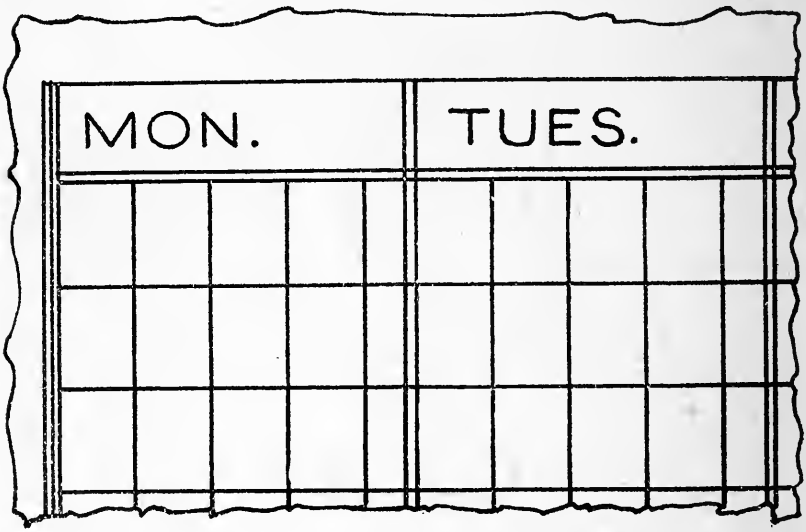


Figure 3

This ruling is indicated in Figure 3, which is a section from the Machine Record Chart, Figure 4, facing page 113.

On the left side of this chart he lists all the machines in his department, arranging them in groups. At the top of each group he leaves a space for the total of that group. At the top of the

sheet he leaves a space for the total of the department. Opposite each machine number he indicates whether or not the machine has been running by drawing a light line through the time during which the machine ran. A blank space indicates that the machine did *not* run, and in that space he places a letter or symbol to indicate the reason why. Under the light line he draws a heavy line to indicate the *cumulative* running time of the machine for the whole week. The length of this heavy line is always equal to the sum of the light lines for the various days. The running time of the individual machines in a group is averaged, and the light and heavy lines entered for the group total. In the same way the groups are averaged to get the total running time of the shop, and the lines to indicate this are drawn at the top of the sheet.

In this chart the foreman has a graphic record of the running of his machines, which enables him to visualize his problem and to grasp the facts and the tendencies much more firmly than he could from any written record or from watching the machines. Moreover, the chart emphasizes, above everything else, the reasons for the idleness of machines, and those reasons indicate very clearly who is responsible for the idleness. It is at this point that the foreman *translates the chart into action.* He eliminates as much as possible of the idleness for which he or his subordinates are responsible. If machines have been "waiting for set-up," he plans the work of his set-up men more

carefully, and, if necessary, trains an additional set-up man. If machines are "idle for repairs," he does all he can to push the completion of the repairs.

A considerable part of the idleness of machines appears to be due to causes over which the foreman has no control, so he takes the matter up with his immediate superior, who may possibly be the superintendent. He shows the charts to him and asks for his assistance in avoiding further idleness. If machines are down for "lack of help," the superintendent gets better cooperation from the Employment Department or raises the wages offered. If idleness is due to "lack of tools," the superintendent takes the matter up with the foreman of the tool room.

If the trouble is "lack of orders," he takes it up with the Sales Department. In each case the reason for the idleness is made clear and the matter taken up with the one who caused it. In any event, the only way for the foreman to be sure that his machines will be run any certain day is to assign work to them not later than the afternoon of the day before. This he does on an Order of Work sheet as described in Chapter 2.

Key to Machine Record Chart (Gantt).—The following key explains the lines and letters on the Machine Record Chart, Figure 4, facing this page:

| |	Width of daily space represents working hours of the plant.
———	Time machine was running.
▬▬▬	Weekly total of individual machine.
▬▬▬	Weekly total of group of machines.
▬▬▬	Weekly total of all machines in department.

The portion of the daily space through which no line is drawn represents the time the machine was idle. Reasons for idleness are indicated as follows:

E. Waiting for set-up.	P. Lack of power.
H. Lack of help.	R. Repairs.
M. Lack of material.	T. Lack of tools.
O. Lack of orders.	V. Holiday.

Where there is more than one reason for idleness, the reason entered on the chart is determined by asking questions in the following order:

R. Is the machine ready to run?
O. Is there an order for the machine?
M. Is the material ready to be worked on?
T. Are there tools?
P. Is there power to run the machine?
H. Is there an operator for the machine?

Not all of the foregoing reasons are entered on Figure 4. They are not necessary on this particular chart.

Summary of Machine Record Chart.—In order to keep before him the progress of his department as a whole, the foreman prepares a "Summary of Machine Record Chart" (Figure 6), on which he shows the records, week by week, for six months. On this he indicates, by means of heavy lines, the per cent of his machine capacity which he has used, and, in figures, the total number of hours of idleness and how much of it is due to each of the various causes. The foreman gives this chart to his superintendent, at weekly intervals, as a report of the progress he is making in eliminating idleness of machines in his department.

Delay Reports.—In most shops hardly a day passes that the foreman does not realize that there is work to be done which it is impossible for him to do for reasons over which he has no control. So he lists these jobs on a *Delay Report* (Figure 5, page 115). On the left side of the sheet he lists the order numbers and adds whatever information is necessary as to part names and operations. He then writes down the reason for the delay and the date on which he expects to start each order. This report is made out in *triplicate*—the first copy white, the second yellow and the third blue. The foreman sends the white and yellow copies to the superintendent as a formal request for assistance to overcome obstacles which it is not within his power to remove; and the superintendent is usually able to remove a great many of these obstacles. Opposite each item the superintendent indicates the proper ac-

SUPERINTENDENT Mr. Black DEPT. B

THE FOLLOWING ORDERS ARE DELAYED FOR THE REASONS GIVEN: PLEASE ADVISE WHAT ACTION SHOULD BE TAKEN. DATE Oct. 20

ORDER NO.	PART NAME	PART NO.	OPERATION NAME	OPER. NO.	REASON FOR DELAY	WILL START	ACTION
BC 40	Handle	60	Grind-finish	8	No Material	?	Get from Dept. A at 2 P.M.
BF 29	"	14	" "	8	" "	?	" " " "
BH 82	"	92	" flash	2	Repairs	22	O.K.
BM 104	Cap	840	" rough	4	Behind schedule	26	Use grinder in Dept. K.
BA 60	"	862	" "	4	" "	28	
BP 93	Rod	46	Polish end	12	No operator	?	Employment Dept. will have man tomorrow
BK 91	"	52	" "	12	" "	?	

J. H. White FOREMAN K. Black SUPT.

G34-8M 8ET3-7-19 DELAY REPORT

Figure 5. For explanation see pages 114, 116.

tion and returns the white copy to the foreman, keeping the yellow copy. This Delay Report saves the superintendent a great deal of time and trouble because it brings to his attention the problems on which his help is most needed and he does not have to go around the shop asking people what is wrong and frequently finding out only when it is too late.

In some shops the superintendent thinks that when he has sent an order to the shop his responsibility is practically at an end. It is evident, however, that the superintendent, with his greater experience and larger authority, can be of most service in advancing production by helping the foreman overcome the obstacles with which he is daily confronted. These obstacles are brought to his attention on the Order of Work sheets and Delay Reports.

The *Machine Record Chart,* the *Order of Work,* and the *Delay Report* provide the foreman with a means of visualizing, not only what his machines *are* doing, today, but also what they *should do* tomorrow.

Section II

Visualizing the Progress of Work

The Mechanism of Production Records.—In the ordinary shop there is great difficulty in making out an *Order of Work* or a *Delay. Report,* such as has been described. Few shops are organized in such a manner as to enable the fore-

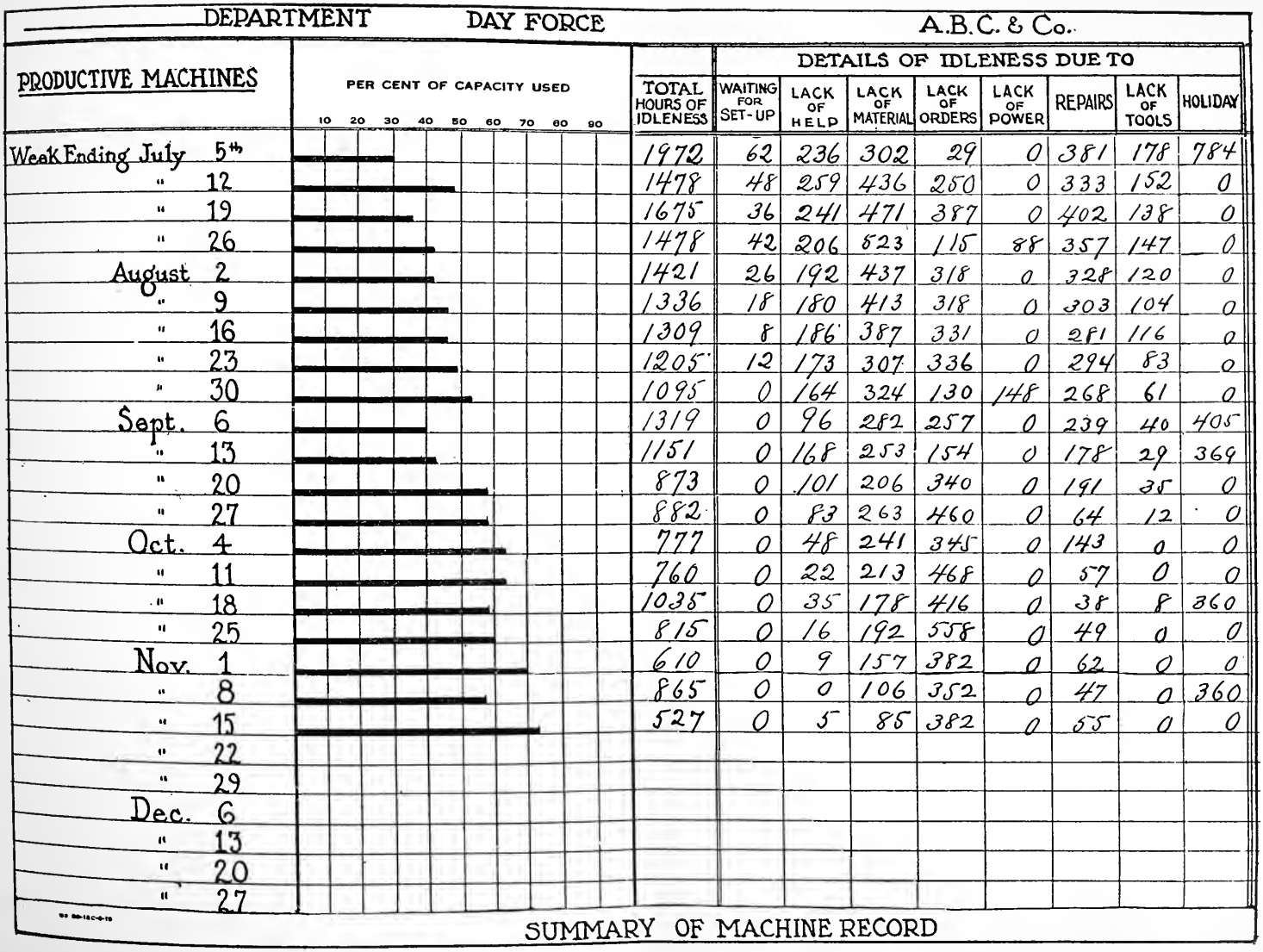


Figure 6. For explanation see page 114.

man or his assistant to do this work readily or regularly. The foreman must therefore be provided with such a mechanism as will enable him through his Order of Work sheets to advise the superintendent as to his plans and their accomplishment, and through his *Delay Reports* to request whatever assistance he may need.

This mechanism consists of *Shop Orders,* a *Layout Sheet, Production Cards, Man Record Charts, etc.* It is a simple and dependable method of keeping track of orders and work done.

What Shop Orders Must Show.—First of all, the foreman must have orders from the superintendent's office telling him what work is to be done. It is desirable to have these orders show:

What is to be done (the details of what and how may be shown on blue prints or in writing).
The number of pieces to be made.
The material to be used.
The date the work should be completed.

If more than one operation is to be performed on an order in his department, the foreman will write on the order the various operations. If they do not come to him in duplicate, he will make out a second copy so that he can file one set by order number and another set according to the machine on which the first operation is to be done. When that operation is completed, he checks it off and files the order to the machine on which the next operation is to be done. From the file arranged by machine numbers he gets the in-

formation necessary for making out his Order of Work and Delay Report.

On the back of the orders filed by order numbers he enters receipts of material, the number of pieces done each day on each operation, and his deliveries to the next department. From this file he answers questions in regard to the progress of work on orders.

The Layout of Jobs.—In order to make out an Order of Work sheet, the foreman goes over his file of orders arranged by machine numbers; but he finds his planning difficult, because he cannot visualize the *time* required to do the various jobs. He therefore writes on the Shop Orders, opposite each operation, the time it will require to do the work, and finds out when he will receive the material if it is not already on hand. The foreman then takes a sheet, ruled by hours, similar to the one on which he has drawn the Machine Record Chart, and lays out the orders graphically on that sheet. Figure 7, page 120, shows a Layout Sheet. The key to it is on page 121.

On the left side of this sheet, he lists the machines as he did on the Machine Record Chart. Opposite each machine he draws a line extending through the time each job will take, with an angle indicating the beginning and the end. Above that line he writes the order number or whatever is necessary to identify the job. When he has laid out the orders he has on hand, he can see which machine will first run out of work and, when another order is received from the superintendent's

office, he assigns it to that machine. If the superintendent asks him when he will finish any particular order, the foreman can tell him with considerable accuracy by referring to this sheet.

This graphic layout enables the foreman to group his orders and distribute them over his machines in a much more intelligent manner than by the hit-or-miss method of waiting until a machine runs out of work before deciding what its next job will be.

As the work proceeds on the various orders, the foreman draws a heavy line on the chart through each order to indicate the amount of work done. A glance at the Layout Sheet will at any time tell him how far he is behind or ahead of his schedule. When he falls behind he lays out, at the end of the line for that machine, an amount of time equal to the delay, so that when another order comes in he will know when he can reasonably expect to begin it.

This Layout Sheet will at all times tell the foreman the load on his department and the work ahead of any class of machines. When a machine breaks down, it makes it easier for him to transfer the work from it to other machines without disturbing the proper sequence of work.

The value of the Layout Sheet is illustrated by an incident taken from a New England shop. The superintendent was all out of patience with one of his foremen. Delivery of a certain order had been promised within two months, but when he had asked this foreman just when he could finish his

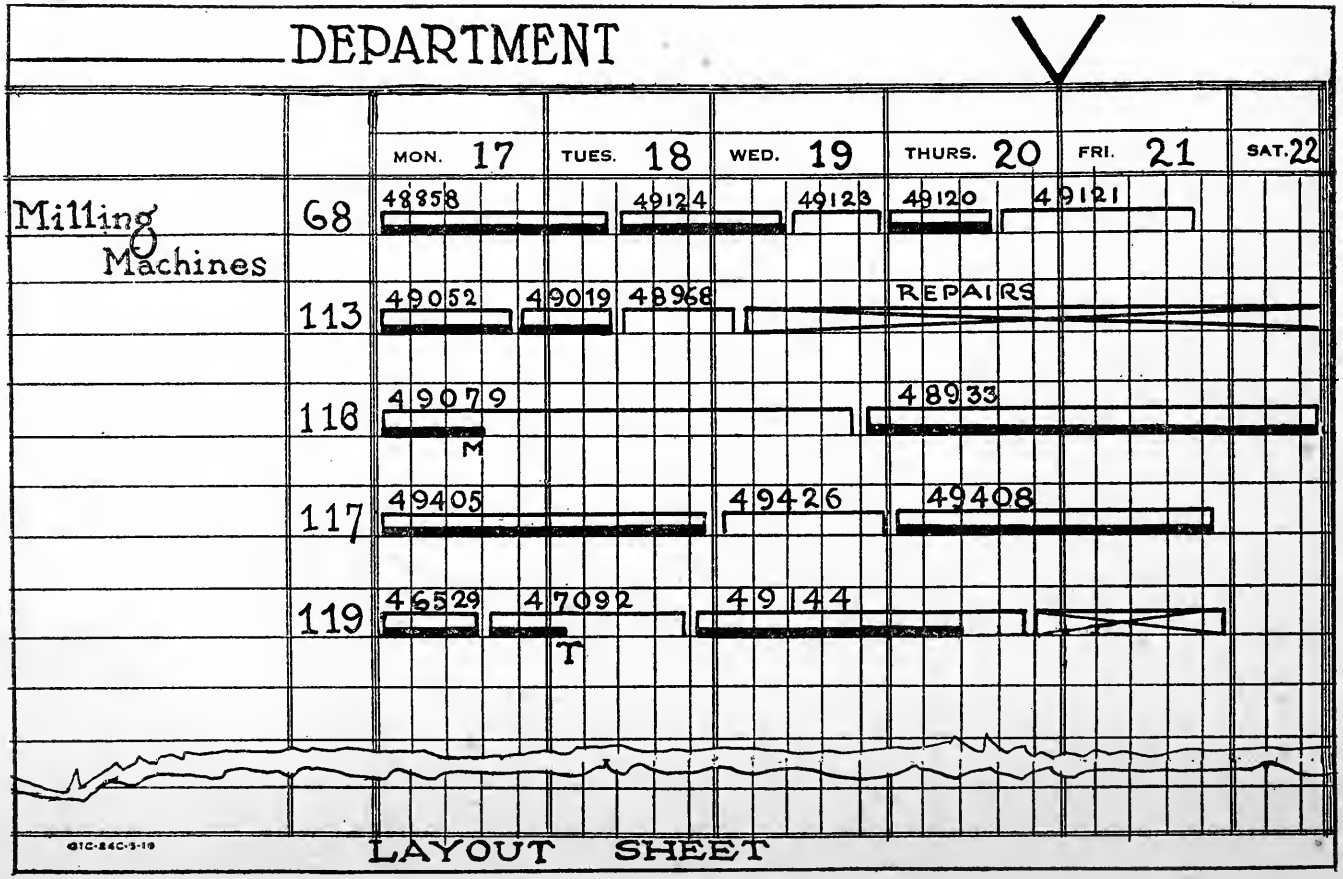


Figure 7. For explanation see pages 118, 119, 121

Key to Layout Sheet.—The following key explains the characters on the Layout Sheet, Figure 7, facing this page:

⌜	Date job is scheduled to start.
⌝	Date job is scheduled to be completed.
⌜——⌝	Total time scheduled for order.
▬▬▬	Work done.
▭▭▭	Time required to make up for past delays.

Figures above lines are order numbers.

Reasons for stopping work are indicated with these letters, as may be necessary:

H. Lack of help. P. Lack of power.
M. Lack of material. R. Repairs.
T. Lack of tools.

The V (at the top of lines separating Thursday from Friday) indicates that the chart was reproduced Thursday night and showed how the work stood at that time.

part of the work the reply had been, "Ten weeks." No amount of argument from the superintendent changed the foreman's decision, although he did say that if he had two more machines he could finish the work in eight weeks. The superintendent felt that he was stalling, so he went out into the shop once more and urged the foreman to promise delivery in less than ten weeks.

The foreman showed him his Layout Sheets: the material was not expected in for three days, and, after its reception, it had to go through several operations; the first and fourth operations were long ones. When the superintendent looked over the Layout Sheets and discussed the time allowed and the probable delays, he could see that the machines on which these two operations must be done were loaded to their capacity, while the machines for the other operations would be idle part of the time. These Layout Sheets pointed very clearly to the solution. The superintendent took them to the owner, explained them to him, and showed him that he must either tell the customer that delivery could not be made in less than ten weeks or that two new machines must be installed immediately, one for the first operation and one for the fourth.

From that time on the superintendent had absolute confidence in the promises this foreman made.

Production Cards.—Before the foreman gets his Order of Work and Shop Orders running smoothly, he finds difficulty in telling the men what orders they are to do next and in finding out what work has been done, unless he already has Production Cards. These are sometimes called "Job Cards," "Time Cards," and various other names. He uses these cards to tell his workmen what jobs they are to do, and to record the work done. A complete Production Card should show:

What work is to be done.
Who worked.
When he worked.
What he did.
What he was paid for it.
What machine was used.

It can readily be seen that these cards form the basis of all production and cost records. It is important that they be filled out with *great accuracy,* and the foreman will find that his records will be handled with fewer mistakes if he has a production clerk who is thoroughly familiar with the machines and orders in the shop, rather than a clerk who is merely quick at figures. The additions can easily be checked, but it is difficult to detect errors in order numbers or machine numbers.

Man Record Cards.—When the foreman has his work pretty well planned and all of his records coming through with fair accuracy, he can begin to look into the individual production of

his operators. It is difficult to get a very clear idea of any man's production by going through a large number of Production Cards. Accordingly the foreman has the records transferred to *Man Record Cards,* one for each workman. A form for this card is given in Figure 8, page 125. On these cards the work done and the time taken are entered, but the time taken is not of very much value until it is compared with the time which should have been taken. The foreman sees the advantage of making an estimate of the time a job should take before it is begun. If there is in his possession accurate information on these points he makes use of it and, if not, he makes the best estimate he can, based on his past experience, keeping in mind that his estimate is what a good man should do on a good machine without taking into consideration individual ability.

This estimated time is written on the Man Record Card, and, when the workman fails to live up to the promised estimate, the reason is written in the last column of the card.

Man Record Charts.—It is difficult to get a comprehensive idea of the information entered on the cards or to compare one man with another, so the foreman enters these records on a *Man Record Chart.* Figure 9, facing page 129, shows a form for this chart, the key to which is on page 129. He lists his workmen on the left side of the sheet, arranging them in groups under his subforemen if he has any; if not, he groups them

MAN'S NAME Theodore Brown MAN'S RATE 75 MAN'S NO. 31

DATE		ORDER NO.	PART NO.	OPER. NO.	OPERATION NAME	MACHINE NO.	NO. OF PIECES	TIME		REMARKS
								ESTIMATED	TAKEN	
Oct	23	AB 510	21	8	Grind Finish	202	50	2.	1.8	
		AB 824	21	"	" "	"	12	.5	.5	
		AC. 578	34	2	" flash	"	250	5.4	6.7	Too much flash
	24	BD 120	14	4	" for drill	"	33	—	2.4	Special
		AF 200	17	2	" flash	"	200	4.5	5.	
		BC 702	60	8	" finish	"	68	.8	1.6	Material Bad

G12-20M-4-19 MAN RECORD

Figure 8. For explanation see pages 123-124

according to kinds of machines. On this chart, the wide columns, one for each day, represent the amount of work that should have been done in a day. On the Man Record Card, the foreman foots the day's work of the operator and divides the time actually taken into the estimated time. The resulting percentage represents the comparison between the work actually done and what the foreman thought should be done. For instance: An operator has taken eight hours to do work which the foreman had expected him to do in six hours. He therefore divides eight into six which gives him 75 per cent. The foreman then draws a light line through 75 per cent of the space for that day.

If the operator has taken eight hours to do the work which the foreman estimated would take the average man twelve hours, he divides eight into twelve and finds that the man has done 150 per cent of a day's work. He accordingly draws a light line all the way across the daily space and another line one-half way across.

If the foreman has not estimated the time any job should take, he draws a broken line through a space equal to the time actually spent on that job.

The portion of the daily space through which no line is drawn shows how much the operator has fallen behind what was expected of him. In this space he indicates, by means of a letter, the reason for falling behind as shown on the Man Record Card. For instance:

A. Man is absent.
G. Man is a green operator, etc.

If there is more than one reason for falling behind, the one to be entered on the chart is determined by asking questions as listed on the key to the Man Record Chart given on page 129.

At the end of the week the foreman draws *heavy* cumulative lines to show the weekly total of each operator—the heavy lines always being equal to the sum of the light lines. To get the group totals he adds the heavy cumulative lines in each group and divides by the number of men in the group. To get the total of the whole department, the heavy cumulative lines of the group totals are added, and then divided by the number of groups.

This department total line shows the foreman how his department, as a whole, is living up to his idea of what it should do. If it is not satisfactory, he can glance over the various group totals and see which group or sub-foreman has fallen behind. Then, by looking over the individuals responsible to that sub-foreman, he can see in detail the reasons why they could not do the full week's work and which individuals are most in need of help. This plan will enable him to concentrate his attention on specific difficulties; and, on account of his greater authority, he will be more successful in removing those difficulties than the sub-foremen.

When the foreman has drawn up these Man Record Charts, he is usually surprised to learn

that the failure of the operator to do the work within the estimated time is more often his own fault than that of the workman. He learns how much of the time of both machines and operators is wasted because of the improper sharpening of tools, defects in materials which should have been caught by the inspectors, unsatisfactory condition of machines, and lack of proper instructions on new jobs. He understands, better than ever before, *why* the costs of so many jobs exceed his estimates.

These charts give the foreman such information about individual production as will enable him to instruct those men who are most in need of help. They give him, also, a fairly accurate basis for regulating the wages of his operators in accordance with their production.

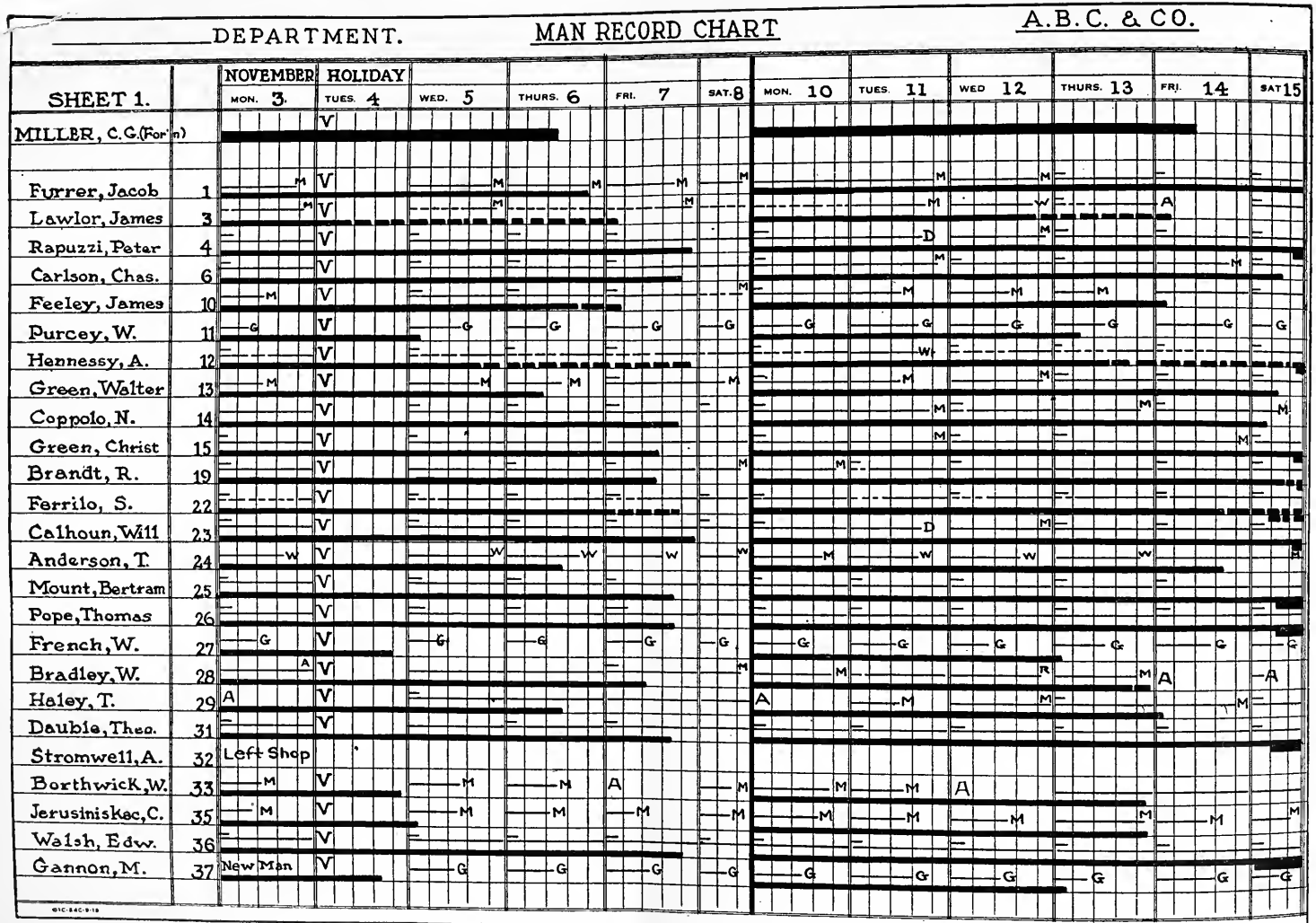


Figure 9. For explanation see pages 124-129

Key to Man Record Chart.—The following key explains the characters used in keeping the Man Record Chart, Figure 9, facing this page:

| |	Width of daily space represents amount of work that should have been done in a day.
————	Amount of work actually done in a day.
— — — — —	Time taken on work on which no estimate is available.
——— - - -	Weekly total of operator. Solid line for estimated work; broken line for time spent on work not estimated.
——— ▬ ▬	Weekly total for group of operators.
▬▬▬▬▬	Weekly total for department.

The portion of the daily space through which no line is drawn shows how much the man has fallen behind what was expected of him.

Reasons for falling behind are indicated, whenever necessary, as follows:

A. Absent.
G. Green operator.
I. Lack of instructions.
L. Slow operator.
M. Material troubles.
R. Repairs needed.
T. Tool troubles.
V. Holiday.
Y. Smaller lot than estimate is based on.

When there is more than one reason for failure to do the work in the estimated time, the reason entered on the chart is determined by asking questions in the following order:

R. Was the machine in good condition?
T. Were the tools and fixtures in good condition?
I. Was the operator given proper instructions and sufficient information?
M. Was trouble experienced with material?
G. Was the operator too green to do the job?
L. Was the operator too slow?
Y. Was the lot smaller than estimate is based on?

Section III

Making Sure of Adequate Supplies

Keeping Stock Up to Requirements.—Nearly every foreman has to keep, in his department, at least a small stock of tools or supplies which he uses constantly. (Material for manufacturing purposes is usually kept by a separate stock-keeper.) The reason why the foreman keeps these tools or supplies in his department is *to have them on hand when they are needed.* With this end in view the foreman plans to place his order for more before he runs out of stock. This is a matter which frequently causes a great deal of delay and annoyance; but when it is handled in a simple and common-sense manner it gives no trouble at all.

The first thing the foreman does is to make a list of all the kinds of tools or supplies he intends to keep in stock. This list is made up on a card or in a book ruled and headed as follows:

Material	Order Point		Quantity to Order	
Items	Time	Quantity	Time	Quantity

It is wise to limit the material to be kept in stock to as few items as possible, for the more items there are kept in stock the greater will be

the cost. The foreman realizes that the cost of keeping material in stock is made up of:

A. Interest on money invested.
B. Waste and spoilage.
C. Rental and maintenance of space occupied.
D. Losses due to material getting out of date.

Having decided on the items which it is necessary for him to keep in stock and listed them, the foreman wants to know when to place his orders.

The Meaning of "Order Point."—By the words, "Order Point," which you will note on the sample form already given, is meant the point at which an order should be placed for an additional supply. This point is determined by two things:

1. The time it will take to get a new supply.
2. The amount likely to be used during that time.

Suppose that a certain tool has to be kept in stock and the foreman knows by experience that from the time he places an order for a new supply until it is received and on his shelves about two weeks must elapse. He finds out how many tools of this kind are likely to be used in two weeks. Let us say 10. Under "Order Point" on his list, he writes "2 weeks" under "Time" and "10" under "Quantity," for 10 is the point at which an order should be placed so as to allow time for the new supply to be received before the old supply is used up.

Marking Order Points.—Writing down these order points on the list will not, of course, prevent the running out of stock. It is necessary to have some way of automatically calling to the attention of the man who takes tools out of the bin the fact that the order point has been reached. The foreman therefore marks the order point on the material itself.

For example: If he has in stock 40 tools of a certain kind and the order point is 10, he ties a cord around the 10, attaches a red tag and piles the remaining 30 on top of the 10. When the 30 are used up and it is necessary to break open the package of 10, marked with the red tag, the foreman is automatically notified that he should place an order for an additional supply. This is the surest way to avoid running out of stock, for nothing is left to one's memory.

Quantity of Supplies to Order.—The foreman now has his stock-keeping in such shape that he can turn it over to one of his assistants. The only thing he needs to add to his list is the quantity to order. He decides just how often he wants to order and, from that, he figures the amount he will use in that time. In the case of the tool mentioned in the preceding paragraph, where the time of the order point was two weeks and the quantity 10, he may think it advisable to order enough to last eight weeks. If 10 have lasted two weeks, it will take 40 to last eight weeks. Accordingly, he writes "8 weeks" and "40" on the list under "Quantity to Order."

This is the simplest possible method of stock-keeping. If the order points written on the list are correct, if they are carefully marked on the material itself with red tags, if orders are placed for more as soon as the order points are broken open, the foreman will always have tools and supplies *when* they are needed, and will not be forced to stop work for lack of tools or supplies. If he is careful in deciding on his order points and quantities to order, he will be able to keep his investment in tools and supplies down to a low figure.

The Value of Production Records.—The mechanism described above enables the foreman to turn out the orders he receives from the superintendent's office in the sequence desired and to report work as it is done. He also has charts showing him how well he succeeds in keeping his machines running and how the amount of work done by his operators compares with the standard which he has set. These charts show the foreman at a glance a comparison between what has been done and what should have been done. They indicate with great accuracy the probabilities of future performance and enable him to anticipate his needs and prepare for them.

"The broad application of this method of showing the relation between what has been done and what should be done will immediately suggest itself." It has been used in small shops and in the biggest industries spread all over the country. Where machines are not used, the foreman plans

his work for gangs of men or individual men and his Order of Work and Layout sheets are arranged accordingly. If the reasons for these methods and their operation are thoroughly understood, an intelligent foreman will be able to adapt them to any kind of work.

These methods form a complete mechanism, not for getting things done, but for *furnishing the information needed by the foreman in order to get things done.*

Records cannot do anything of themselves; it is only the action of the foreman based on those records that accomplishes results.

Part II: The Foreman

THE FOREMAN AND LABOR

Section I

The Foreman and the Man

Effects of Environment on the Individual.—In Chapter 2 we spoke about the worker as a man and as an operator, and the things about the man which enter into the quality of his work and the capacity of his operating skill. It was necessary there to show the difference between men as workers and the difference in their attitudes toward their work. In this chapter we want to consider the worker as a man in his thoughts and desires and opinions, because the worker brings to his work, not only those habits of mind and body which affect the quality and skill of his work, but he also brings with him his ideas about his family, his neighbors, his politics, his religion, his tastes, and everything else.

While these things are not directly connected with his working capacity, they are so closely tied up with his relations to other workers, his attitude toward the company, and his contentment, that they affect his capacity to work or to remain at work. In other words, these things are a part of his contentment with his work or his desire to move from job to job. They are a part of his way of looking at his work and they make him put his heart into his job or keep him from

putting his whole spirit into it. The man we were talking about as a worker is the *machinery* of the man—his mind and bodily skill. The man we are now considering as an individual includes the whole man—the spirit within him as well as the physical machinery which the spirit uses.

We say that a man frequently gets into work which does not fit him. As far as muscle is concerned, he may have enough for the purpose; as far as skill is concerned, he may do as well as the average. What do we mean then? We mean that the man cannot put his whole self into the accomplishment of the job, and therefore he is not in suitable work.

Just as some men are tall and others short, some dark and others fair-haired, some cheery and others serious, so some men are sensitive to praise and can work better when they receive encouragement, while others are keen to sense an injustice—are almost morbid about injustice—and will see something wrong even where it is not intended. Some men can stand a lot of grilling and work well under it; other men wilt and become discouraged. Some men like honors better than money, and others are the reverse. They all require different methods of treatment.

Ways of Handling Men.—I know one man who is accounted cold-blooded and reserved even by his best friends. I have seen him so shaken with emotion that he had a hard matter to control himself. The effort alone forced all the blood from his face. He admitted to me—perhaps be-

cause he knew I had seen it—that he had to assume that attitude of reserve to keep control over his emotions. Many a man has failed to get the best out of my friend because he did not understand that peculiarity in his make-up as an individual.

There are many people whose pride is as simple and great as the pride of the child who has secured a good mark or won a prize in school, and there are others whose pride is of the variety which knows only the magnificence of its own capacity—like a peacock. The first can be handled and educated; the last must be tolerated—it is almost impossible to cure it.

One time I had to handle a gang of toughs on a shovel job, who took kindness for weakness, and I was obliged to thrash the leader before we could be friends. I had a hard time doing it, too. During the war, one of my friends had been put in charge of a gang of Chinese laborers from Shanghai—wharf rats, with no moral instincts, the poorest specimens of humanity. He was congratulated for having the best-disciplined gang in that section, but he informed me that he had three fights before he managed to whip his gang into shape.

On the other hand, I once saw an old army sergeant, who had been used to drilling recruits from the coal mines, try to handle a bunch of rookies from a college. He had to quit. He tried to browbeat and bully those fellows and they wouldn't stand for it. A mild-mannered,

little, bespectacled lieutenant came along and soon had those men so they would go through fire and water for him any day before breakfast.

Men as individuals vary in all their spiritual reactions and the man who makes his living by handling other men must know them as individuals. In fact, most of the business leaders today are beginning to require their supervisors to have more exact knowledge of people; and they are using more care in dealing with men than they take about any other part of the business. Because Jim can be handled in one way is no reason why you should try that way on Joe. As a matter of fact, you know that both can't be handled alike. The more the individual is studied, the more effectively he can be supervised with less work on the part of the supervisor.

Working with the Individual.—In most large groups it is true that there are some men who cannot be kept within the reasonable limits of efficiency and order without the fear of disciplinary measures. Usually, however, men will respond much more readily to a decent square deal, sympathy, and some commendation of their work from the foreman. They will give their energy, their skill, and their loyalty to such a man. Not only that, but they will improve themselves and give him the value of that improvement.

The great object of the supervisor is to draw out the skill of the worker, to develop his intellectual capacity for the purpose of improving his skill; and to do this with a minimum of turnover,

a minimum of friction, and a maximum of enthusiasm. This shows itself in the practical effect upon the amount of work which the men turn out, the way in which they stay on the job, and the way they talk about the job.

On one tunnel job which involved a lot of rock-boring, we had a gang of drillers who could drill and shoot faster than any other gang on the job. The foreman of this gang was a remarkably skillful rock man himself, although he was very quiet and scarcely ever resorted to browbeating the men as most of the foremen were accustomed to do on that kind of work. Rock drillers on tunnel work are a rough, hard lot, and it is not easy for them to work together as a group. This fellow, in his quiet way, without any bluster, had so thoroughly imbued each of the workers in his gang with belief in himself and his ability that they swung through their work like a big league ball team. Of course, he always had bits sharpened in sufficient quantities to keep his men well supplied. Water was at hand in plenty. Dynamite and fuses were placed so that no time need be lost. He could get the tool men to work on the drills between shifts in order to keep his gang up to the minute, and it used to be a pleasure to watch those boys make the pace for the whole camp, day after day, without the usual jealousy and scrapping.

Section II

The Foreman and the Conditions

Old vs. New Attitudes toward Environment. It's a pretty hard job to go to work while on a vacation and paint a house situated close to a fine ocean front; especially if you haven't had the opportunity of sitting on the beach very often. The desire to do something else than to work at a painting job is very apt to strengthen greatly under such circumstances. And, too, it is not easy for a man to get up in the morning by gas or electric light and travel in the dark to his work; and he doesn't feel entirely like working when the journey is completed. Nobody feels quite as full of energy on a gray day, with cold clouds all over the sky, as on a day when the sun shines and the sky is bright. All people feel their surroundings to some degree, and their personal efficiency is affected by the feelings occasioned by the environment.

When the factory system first started we did not know these things; we didn't see why it should make any difference whether the factory was dusty and dull or white and shining. We did not think of such things as cleaning windows or making enough space to provide all the light necessary for the workers. We did not think much about the effect of good-looking buildings, comfortable floors, dry washrooms, warm dressing rooms, sufficient fresh air, and adequate lighting. In so many lines of industry the older factories show

these shortcomings by small windows, dark-coated inside halls, poor floors, lack of any real plan of ventilation, and other deficiencies.

New factories are not affected in this way. Doctors and engineers have proved that men must have fresh air, plenty of light, a warm atmosphere, with clean, dry, and comfortable surroundings if they are to do their work properly with the least possible errors. So the newer factories are built of glass with a framework of brick or concrete. They provide the best known means of ventilation. They can be kept clean easily and they are comfortable working places. Even in a few lines where sunshine and warm air are not possible, the hardships of the surroundings are mitigated as much as possible.

There are many older factories which cannot be altered to meet modern standards. The buildings cannot be torn down and rebuilt without too great interference with production, and so it is necessary to use them, with all their defects, until they become old enough to require rebuilding.

There is no excuse in any plant for dirty windows and dirty inside walls. Walls, whether old or new, can be painted so that they are washable and they can be kept clean. They can be arranged to catch and reflect the maximum of light and thus aid the men at work instead of hindering them. Artificial lighting, too, can be arranged to give the operator the maximum light and minimum discomfort. The simple sanitary conveniences and other requirements for personal comfort can be

arranged in any factory building. No concern priding itself on shrewd foresight would go without these things, because it has been understood for a long time that light and fresh air, heat and dry comfort are necessary to the maintenance of a decent working place. Moreover, they affect production and labor turnover immediately and vitally.

There are other matters connected with the surroundings which have not been visioned quite as clearly, but which affect the work just as much as those mentioned. It is not long since we supposed that dust and smoke in the ordinary foundry were necessary to the foundry business and could not be done away with. Some concerns, however, have built foundries which have just as much ventilation, light, and heat as any other shop and are just as comfortable to work in.

It took us a long time to learn how to manufacture chemicals so that the workers could be comfortable and healthy. The engineers are constantly studying these things and they are aided by the doctors, so that every day we are acquiring more knowledge of how to arrange comfortable working conditions. Whether the surroundings are good or bad, they affect the work of every man who must labor in them. If the surroundings continue to be bad, the efficiency is reduced and labor turnover is increased. While the main conditions as to light and heat and air are taken care of by the engineers, the foreman should see to it that these things are looked after, and that the

surroundings of the individual in his group are best suited for his work and comfort.

Production Affected by Environment.—When the factory system began, about one hundred years ago in Great Britain, the values of proper lighting, plenty of air, proper heat, dry floors, and pleasant factory grounds were not known at all. The earlier factory workers in those days had very little ventilation or light and no heat. They frequently worked under conditions sure to promote disease and reduce the quality and quantity of work. It was not until much later that the effect of surroundings upon the man's capacity to produce and upon his state of mind toward his work was appreciated.

My memory recalls very distinctly the dye-house of a factory I worked in as a youngster. It was always dark enough in there to require a lot of artificial light and many extra trips were required to bring dyed samples to one of the far windows to be examined. The floor of the place did not drain as it should and there was always water on it. The workmen had to stand on boards by the dye vats and the centrifugal machines so as to be out of the worst of it. Ventilation was bad and the steam did not have a chance to escape. Working in there was not only disagreeable; it produced, in time, hatred for the job. I dreaded going into the place, in the winter-time, to endure the dampness, the absence of daylight, and the smell of the dye. I began to suspect the manage-

ment for allowing such conditions and became bitter toward the factory and the job itself.

As a contrast, I went through a modern dyehouse not long ago. There was plenty of light, heat, and ventilation—a cheerful, comfortable place to work. Floors were arranged to drain rapidly and with no discomfort to the worker. It looked as though everything had been thought out with the worker's necessities and comfort in mind and I suppose it had. The engineers who designed that plant and the men who built it studied the whole thing in each detail with the object of making it as nearly ideal as it could be for a working place. Lighting was arranged according to plans which were worked out with such necessities in mind; fresh air and ventilation were secured under most difficult circumstances; and a comfortable degree of heat was provided. This is not because people are any more considerate than they were, but it is because we have studied the matter much more carefully. The work of the illuminating, the heating, and the sanitary engineer has been of untold value to all industry. These experts have patiently worked out methods by which it has become easy to provide such surroundings as will increase the efficiency of the work and minister to the comfort of the worker.

It is not necessary to be an illuminating engineer to know that the lights are not as they should be for each individual worker in your group, and you can tell when the heat is not working as it should. To the man who is working in your

group, you are the representative of the whole management; and the promptness with which you appeal to the proper departments when the surroundings are not all they should be will do a great deal to keep the men in a good frame of mind toward the organization.

Men react upon each other when they must work together. Two men who naturally repulse each other, working side by side, will have a very bad effect on the work of each. Some men are more sensitive to noise than others and some are more sensitive to bad air. Sometimes it is possible to take these things into account when the work is arranged. Of course, the condition of the machinery or tools with which the men work might be considered at this point, but such matters require attention at the proper place in the course. The important thing to understand now is the effect of the surroundings upon the worker's efficiency and upon his attitude toward industry, the management, and the whole social organization.

Section III

The Foreman and the Organization

Group Organization in Industry.—Modern organization consists of large groups of men engaged in some common object and with some common background of necessity and ideal, divided into smaller groups and again into smaller groups so that the operations can be arranged properly without confusion.

The political as well as the industrial organizations are built up along these lines. The United States is a large group living under a definite constitution which gives a common idea of government and a common method of conducting the affairs of the country. Within this group are smaller groups called states, governed in some matters by the United States government and in other matters exercising their own government of the groups within the boundaries of their control. Within each state are the still smaller groups called counties which in turn govern their internal affairs but are bound by the laws of the state on all other matters. These counties contain cities, towns, and villages, each handling matters pertaining to itself alone. Finally, we have the family—the oldest and simplest group in the political unit. Industrially, matters are worked out in much the same way, with the industry as the largest unit and the group under the individual foreman as the smallest.

How the Group Evolved.—Suppose we take one of the old cabinet-making shops with ten workers as an example. There was only one boss and he was the owner or master cabinet-maker. He worked along with the men, governed their work, and took care of all matters belonging to the group. He could see what each worker did, could know each one's skill and capacity, could measure the value of each man and tell who was at fault in every controversy, because he was right on the job with them. Suppose this owner

put in some machinery so that he could turn out the products faster. This gave him enough competitive advantage so that he bought four other shops and employed fifteen workers in each shop. Naturally he could not be boss of all five shops and act as the foreman in each. He had to engage five foremen, each to run one shop. Then, of course, he wanted each shop to turn out the same kind of work, so he had the designs made for them instead of having the men make them as had been done when he possessed one shop. That meant hiring one or two men to make designs and get them ready for each shop, so he had to add a department for this with its boss. Then he had to tell the foreman in each shop what jobs to work on, and he had to keep track of the wood consigned to each shop as well as the tools in each shop, so he had to get a man or two to keep records of all this, and one of them had to boss that job.

The proprietor did not now have time to work at the bench himself because he had to buy a lot more materials and tools, sell more product, and look after a number of different shops and departments. This made it difficult for him to keep in touch with each man who worked for him as he had always tried to do. Some of the new bosses in the different shops did not understand men as well as he did and they could not keep the men both happy and at work. Some of the men did not see why they should work for a boss who did not know how to work as they did, and they thought he was making a great deal of

money out of their efforts, while he himself did not seem to be doing anything. They had never talked like that in the old days when the owner worked in the shop, for he had always shown them that he knew how the job should be done and could do it for them if they were stumped.

This is what actually happened until the evolution of group organization spread throughout the industrial world. Each development added new departments and new bosses, so that the number of different supervisors kept on increasing and the necessity for system kept on growing in order that the groups might be subdivided sufficiently to keep at work without getting into confusion and falling over each other. That's why it is so hard to see the necessity for so many rules and records and methods of operating. The groups are so big, they are subdivided into so many special departments and shops, and they are occupied with so many fragments of the work which is necessary to the complete job, that it takes a lot of study and a lot of observation to see the reason for all of it.

Keeping the Group in Order.—When that old chap had been running his five cabinet-making shops for some little time, he heard that one of his old employes was grumbling about having to write his order for wood and kicking at all the new notions his boss was getting into his head, now that he had become so big and wealthy. The man who owned the shops went over to see the grumbler and talked with him as he had done

many a time when he had a bench in the corner of the same shop and used to tell the men to go to the pile and pick out the lumber. Finally, he suggested to the disgruntled worker that he come around with him and look at each of the departments and see what it did and why.

First, he took him over to the yard where the lumber was piled up. Mahogany, oak, birch, pine, and the other woods were there, in all the different sizes required. Then they went into the little office in the lumber yard and the owner inquired about some lumber which had been taken from one pile, asking where it had gone. The clerk then got out his books and the boss showed his grumbling old worker where they recorded the lumber brought in and the lumber sent out. He showed how each shop had the lumber sent to it charged on the books of the lumber yard. Then he told how such lumber would make so many chairs and tables, so many cabinets, and so forth. Next, he explained how each shop was expected to show how many pieces were made out of the lumber sent to it, how much had been spoiled, and other facts.

Before he got through, the grumbler was bewildered with the many things which had to be watched, and "allowed" that he would rather go back to the shop than have to look after all that.

Keeping the group in order means that everybody in the group, from the laborer who cleans up the yard to the president of the company, must have his own work laid out so that every

man is doing his part of the work and not doing something useless and confusing to the system. Every man's work must be understood so that the whole plan may be kept ahead of the requirements.

Every Man Must Know His Job.—Everyone in an industrial organization must have his job thoroughly understood if the organization is to go along smoothly and without any confusion. Not only is it necessary for everyone to hold his job and understand it, but all these jobs must be laid out so that the work will go forward from first to last without a hitch and without a lot of people waiting for other people to decide what they are going to do.

If the job is to make one hundred automobiles in a day, then all the parts, material, and work must be in the exact proportion for the one hundred cars. One hundred frames are needed, but about three hundred thousand bolts and nuts will be used. One hundred carbureters are enough, but it will take many more piston rings.

Perhaps some of the parts need more care and better workmanship; then more time must be allowed for the work in order to permit the men to put it through in the required quantity. This orderly progress must be recorded so that the time, the tools, and the men required for each part of the work can be recorded and every item of expense determined. The cost of each part must be known and the cost of each operation determined. In that way only is it possible to

ascertain the total cost of the completed automobile.

The human side of the matter lies in the proper definition of each man's work and the accurate recording of its results. It means the arrangement of the workers so that every job will produce just the quantity and quality required to complete the whole machine—an automobile ready to be sold to the customer at a profit to the company.

Section IV

The Foreman and the Product

Intelligent Thought Precedes Intelligent Labor. We must always bear in mind the fact that the intelligence of man preceded the making of useful material; and that nothing ever became useful until intelligent thought had been put upon the possibilities of its use and intelligent labor had been given to making it useful.

For everything we use as materials in our work, we are indebted to thousands of other men who have worked through past centuries in the effort to improve these materials so that they might be useful to us.

We are apt to forget that all these raw materials—gold, silver, copper, iron, wool, cotton—were of no use to us until man applied his thinking powers and his observation to determining what they might be used for and then found ways

to prepare them for use. When we use any of these materials in our work, we are the direct inheritors of the patient study and labor of all the thoughtful workers who have gone before and, by their thought and skill, have left us a richer knowledge and larger means for enjoying the materials which they discovered as well as the original methods of making them useful. If this is true of the materials, it is true just as well of the tools with which these materials are turned into useful products.

The discovery of the plane and the saw must have required years and years of patient thought and study before they lessened the work of our forefathers, by a great deal, in producing the necessary things for their comfort. It is even useless to speculate how long it took for the human race to learn how to comb and spin the fleece of sheep and to make cloth out of it which could be worn instead of raw skins with the fleece still on them.

We have thousands of different tools today, magnificent in their size and almost unbelievable in their capacity, which became possible because some man or men thought out how these tools might be made and then put in the study and labor necessary to make them according to their previous thoughts.

We have all of us smiled a little at the inventor who spent all his money and years of his life in attempting to make a new machine or a new tool; but we have benefited by that study in the things

which we make today and in the conveniences of life which they produce. Every tool that we use is a part of the inheritance that came to us from other men, and it is itself a visible reminder of the obligation we owe to other men to pass on the kind of inheritance which we have received. The tools with which we work represent the service rendered to us in time, thought, and skill by other men, and the product which we turn out represents our discharge of an obligation to be serviceable to other men.

What Is Production?—Production is the art of taking the material and fabricating it with the tools which are available to us so that it will become useful to us and to somebody else. The material is what we get from other workers, and our job is to alter it or combine it with similar or different materials by the use of hands and tools in order that it may be serviceable. It is necessary for us to arrange the tools so that we can get the maximum of quality and quantity in executing the service and, in turn, we expect that those who hand us the material and who supply the tools will produce their maximum in quality and quantity.

The three elements of our service are the material which we receive, the tools with which we work, and the arrangement by which we take care of the operations we are to perform as a group of workers. The efficiency of the work depends upon the delivery of the material in the quantity and of the kind required for the work, and

the keeping of the tools in such condition that they will perform the work with the accuracy and speed required, so that the work can be done with the least confusion and with the simplest possible movement in connection with its handling.

In a general way, these matters are arranged in accordance with the purpose of the job and the part which it plays in the production of the whole factory or shop. But the details of this arrangement in connection with the group with which you are concerned will require close study on your part because they have so much bearing upon the work which is accomplished.

Everything in the surroundings of the work reacts upon the quality and the quantity of the work which the individual worker can turn out. The material which has cost the energy, labor, and study of other men should not be carelessly used and spoiled because of the attitude of the individual who works with it. No man likes to do work unless it is useful and is so accepted. The man who has spent his time and labor and thought in producing the materials which you use has put the other workers who will use that material under an obligation to give it as good service as they have obtained from him.

When the material is not delivered to the worker in the quantity and of the kind required, this lack of care induces a carelessness on the part of the worker who must use the material. Where the tools are not arranged to give the most convenient service with the greatest efficiency, it is not

long before the worker's idea of efficiency is affected adversely.

All the things which are a part of the job of the individual worker of your group have required the service of other men in their production, and they must be used with care and efficiency if your own workers are to fulfil their part in the total service.

The Purpose of Labor.—The purpose of the material, the tools, the arrangement, and the labor of the worker is the article which this combination produces. The object is to provide some useful product which will be of service to humanity. The thing which is being produced in the factory or in the shop, or which is being produced in the warehouse or on the railroad in the form of service, has gone through the very same process which we described in the preceding paragraphs.

Nobody ever made anything without first thinking about how it might be made, and then trying to produce the thing which had been created in his mind. Every so often, a lot of men, who are engaged in producing shovels, or cloth, or something else, talk about the theorist who draws blue prints or who suggests what might be done, and then argue with each other as to which part of the work is the most valuable. Originally, it was all done by one man. He thought out what he might make with the wood or the iron or whatever materials he was using, then he planned how

he might make it, and endeavored to produce what was in his mind.

The purpose of labor and production is to add value to raw materials by changing their form, quality, or location so that they may the better satisfy the needs of man.

All of the Processes Are Necessary.—Theory is that part of the work which is concerned with what may be done and how it may be done. Practice is that part of the work which is concerned with bringing into being what theory has planned.

It is not probable that the old hand worker, who was a theorist and practician combined, succeeded in producing the thing as he had it in his mind the first time. He produced something, saw where it was wrong, thought a little more, found out how he could improve it and produced something else a little better. So, in modern practice, the designer studies out what might be done to make a useful product more useful and puts that down on paper so that the thing itself can be made from the pictures of it. He takes the materials which he can get and the tools with which the work can be done and decides how the article should be made, and then the practical men take hold of it and see if they can do it.

When the thing is completed it is not as good as they hoped for. It needs changing here and there; sometimes it could be made to do the work better if new materials could be used; sometimes it could be done better if new tools could be made. Therefore, the man who is thinking about how

these things might be made more useful is always trying to get better materials and better tools for the purpose.

Every time a new design is made, it is good in some respects and in other respects it is not so good. Observations are then made for the purpose of perfecting the design. This means that the designer must be acquainted with the material and the tools and the purpose of the product; and all the men engaged in producing it should be acquainted with the same things in addition to the design. It is obvious that the designer of cloth has an entirely different set of conditions to meet from, say, the designer of a crane, and that no matter how much thought the crane man puts upon designing cloth he could not produce valuable results, nor could the cloth designer produce a crane.

The object of each is to think out the best ways in which the material can be handled by the tools to produce, with the least difficulty, a useful article. All the things which enter into the product are, after all, primarily the result of man's intelligent thought and only secondarily the result of his physical skill.

Thought Must Be Put into the Work.—It makes no difference what work the man is engaged in, the quality and quantity of his work will depend a good deal upon his thought about the matter; and no work will be done as well as it might be done if intelligence is not used in connection with it. There are four items in connec-

tion with the product which indicate its comparative value among products of the same kind and which relate to each other so closely that they cannot be considered separately. These are the *design,* the *structure,* the *quality,* and the *purpose* of the product. It is to fulfil these four elements in their proper relation to each other that all the work of industry is going on.

The gang of laborers who are cutting down an embankment in order to provide more railroad tracks are given that job because the railroads must move more products from the place where they are made to the place where they are to be used. The railroad is designed to provide the maximum service in this respect. It is constructed in order to give this maximum service with the least confusion, and its quality is directly reflected in the character of the service which it can render.

The railroad is designed to move the largest amount of goods and the largest number of people with the greatest speed and safety. The whole structure of the railroads is put together with this in mind. The whole organization has been arranged in order to provide the best quality of this service with the largest capacity for it. The purpose for which the railroad is intended thus governs the character of its design, the size and kind of construction, and the quality of the service.

From time to time, the improvements in these designs, in the structures, and in the organization are not sufficiently rapid to take care of the demands for service. The whole problem of indus-

try is concerned with thinking out and arranging improvements in the plan, in the structure, and in the quality of the product so that it may serve its purpose better and therefore bring more convenience and comfort to everybody.

We Are Dependent on Each Other.—The clothes that you buy at the store, the furniture that you need in the house, and all the other items that mean comfort and convenience in your life have been made by other men for your use, and the value of their service is in exact proportion to the usefulness of these things. In turn, they are dependent upon you for some of their conveniences and necessaries, and your service is an essential part of the machinery of service for the manufacture of products which are useful. All this work must go on at the same time—yours, mine, and the work of thousands of other men who are engaged in designing, constructing, or distributing products anywhere in the world.

The value of this depends not so much upon your work or my work, but upon all of us working together. And it is because modern industry has made it possible for us to work together in this service that we are able to enjoy conveniences which no other century has provided.

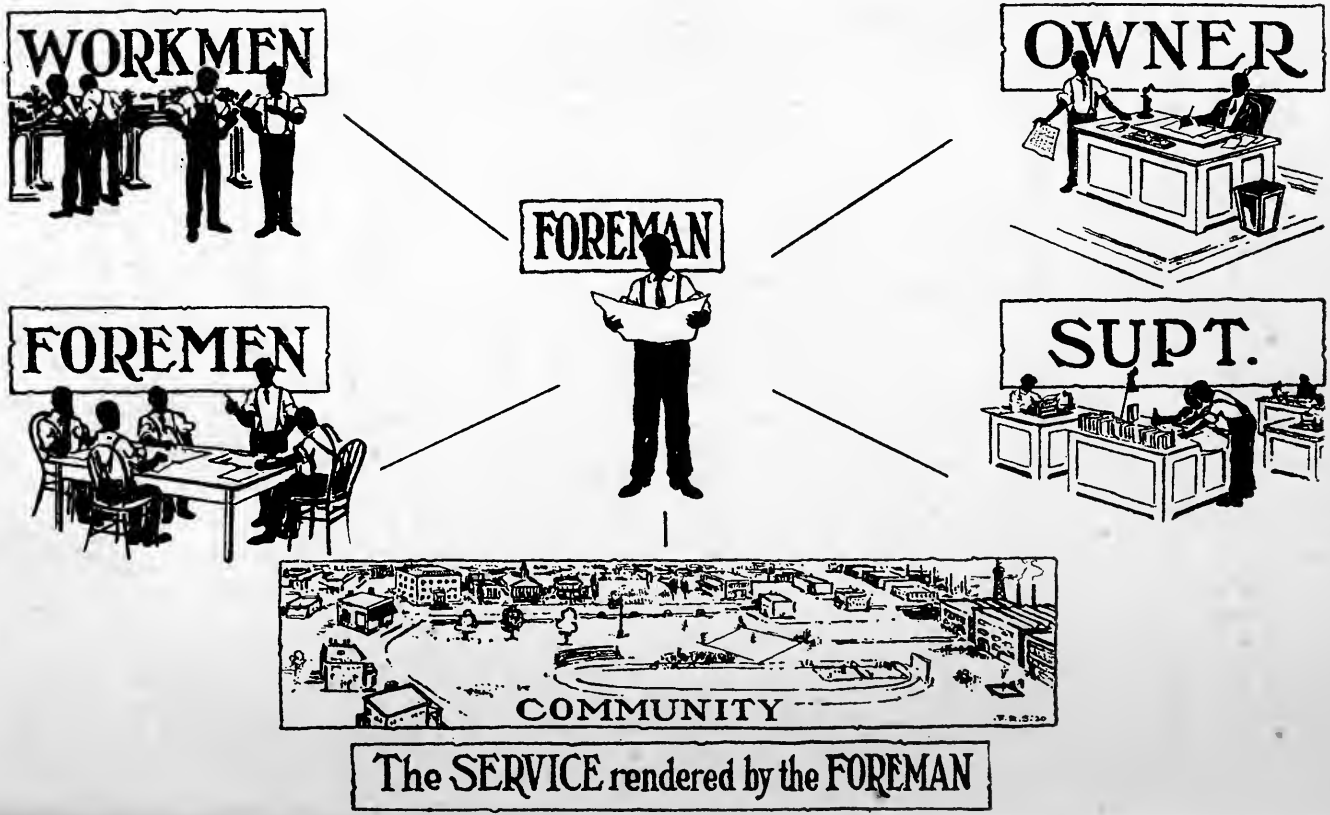
Questions for You to Answer

1. What is the lesson to be learned from the story of Foreman Skinner?
2. What are the two chief responsibilities of the foreman?
3. What is the value of the Daily Idle Machine Report?
4. What values are to be obtained from keeping a Machine Record Chart?
5. What purpose is served by making Delay Reports?
6. How does a Layout Sheet help in getting the work done?
7. What should a Production or Job Card show and why should they be absolutely accurate?
8. What does the Man Record Chart show?
9. What is the value of production records?
10. How does environment affect the individual?
11. How far is the foreman responsible for bad working conditions?
12. Why is group organization necessary in modern industry?
13. What would you say as to the necessity of system in group organization?
14. What is the purpose of industrial labor?
15. To what extent are all the processes in a plant dependent on each other?

Chapter 4

Part I
DEPARTMENTAL RELATIONSHIPS

Part II
THE FOREMAN AND THE SOCIAL ORDER



The SERVICE rendered by the FOREMAN

Part I: The Job

DEPARTMENTAL RELATIONSHIPS

Section I

Service Organized for the Foreman

Service and Democracy.—The days of autocracy in industry are numbered. It is becoming more difficult each day to get adequate production in a shop where all the power is in the hands of one man. There is an irresistible movement in American industry toward a more equal distribution of this authority and responsibility. As responsibility is shared by a greater number of men, it becomes more necessary for them to cooperate. If a plant is to be successful, the various parts of it must be well administered and each must render the necessary service to the other parts.

The new type of foreman appreciates this fact and knows that the best foreman is the one who renders the best service—who gives most help to all those with whom he comes in contact, because it is only in that way that he can permanently succeed in getting work done.

Democracy, in the mind of the modern foreman, means equality of opportunity. Industry is reaching out for a greater degree of democracy and the foreman can do his share—and it is a large share—by giving fair play and equality of opportunity to those under his control. The success of

this more democratic industry depends largely on the help the foreman gives to the workman, the other foremen, the superintendent, the owner of the business, and the public.

Giving service is not an easy task. It takes a great deal more brain-power, energy, and self-control than it does to exact service from other people—that only takes lung power and muscle; but the new type of foreman has that brain-power, energy, and self-control, and, more than that, an unselfish attitude that makes him enjoy giving more than getting.

On the other hand, all departments of the plant must serve the foreman, else he cannot fully utilize the methods outlined in this course and get the work done on time and at lowest cost. While the foreman is rendering service to the other departments, he expects and must receive hearty and ungrudging cooperation from his associate supervisors and from all others holding managerial positions. In no other way can democracy in industry be attained; and in no other way is it possible to utilize equipment, machinery, and men to best possible advantage.

All Departments Help the Foreman.—In a large plant there are a number of service departments which are organized to help the foreman. It is obviously impossible for a foreman to do his real job of getting work done by bringing together the workman, the material, the machine, and the process, if he has to design his own tools, jigs, and fixtures, interview all applicants for em-

ployment, or keep his own stock of materials. In the well-organized plant these things are done for the foreman in order to leave him free to *get things done.*

The wise superintendent tries to make the best use of the facilities of these auxiliary departments, for he realizes that better results can be obtained by placing in charge of such departments men who are specially fitted for that work. A good buyer, in charge of a department which purchases materials and supplies for the whole plant, can undoubtedly secure better prices and deliveries than if the buying were done by a dozen different foremen. A man in charge of repairs throughout the plant is able to devote his entire time and thought to the maintenance of equipment and can get better results than the foremen, to whom the matter is only a side issue.

Repair Department Service.—In order to secure service from the Repair Department, the foreman tells the head of that department *what* he wants done and *when,* with whatever other information may be of value to the repairman. This information is written by the foreman or his clerk on a "Repair Order," of which there are three copies, white, yellow, and blue. A form for this order is given on pages 168 and 169. On this order he shows:

Number of machine to be repaired.
Name of operator.
Whether the machine is partly or totally disabled.

What parts are broken or worn.

What caused the breakdown.

What work was in machine at the time (in order to indicate the relative importance of the repair).

Date by which repairs should be completed.

Date on which machine will be available for repairs (the time between these two dates should be as great as possible).

The foreman sends the white and yellow copies of this order to the Repair Department and places the blue copy in a file marked "Repairs Pending," in his own department.

It is the duty of the head of a Repair Department:

To get repairs done as quickly and as well as possible.

To record the cost of keeping individual machines in repair.

The head of this department handles his repair orders in the same way as the foreman of a productive department handles his shop orders, except that, instead of filing them by machine numbers, he files his orders by the individual workmen or gangs of workmen who are to do the work. He arranges his Order of Work sheet in the same way, showing what work each man or each gang is to do the following day. His Delay Report lists the repair orders he knows should be done the following day but which he will, for some reason, be unable to do. His Man Record Charts are the same as those used in a productive

department, although each job must be estimated separately since so few of them are repeated.

On the backs of the yellow and white copies of his repair orders, the head of the Repair Department writes:

> Operations done.
> Workman who did them.
> Hours spent on each operation.

Either in his own department or in the Cost Department the man's rate is entered, his wages extended, and the cost of material with the overhead expense added in order to get the total cost of that repair job.

When the work has been completed, the Repair Department sends the white copy of the order back to the department in which it originated, and the yellow copy is placed on file either in the Repair Department or the Cost Department. The foreman of the originating department destroys the blue copy, which has been filed under "Repairs Pending," and places the white copy in a permanent file by machine number. From this file he can at any time tell the cost of repairs to a certain machine over any period of time. He also has, in his department, records of the cost of idleness of that machine due to repairs. When he adds the cost of repairs to the cost of idleness due to those repairs, he gets a figure which he can compare with the cost of a new machine. With this information in hand it is not difficult to decide whether or not an old machine should be sold or scrapped.

Rec'd Finished OPERATOR	Machine Symbol	Charge Symbol
	Repair Order No.	
	PARTLY—TOTALLY DISABLED	
	Month / Day / Year	____A. M. ____P. M.

Parts Broken or Worn _____

_____ _____

Cause of Break _____

_____

Work in Machine at Time

	Mo.	Day	Year	A. M.	P. M.
Please Make Above Repairs by					
Machine Available for Repairs on					

_____
Foreman

G20-4M Sets-5-19 REPAIR ORDER

Figure 10. For explanation see pages 165-167

Oper. No.	Operation	Workman	Hours	Rate	Wages

Material	Wages	Expense	Total Charges

Figure 11. Reverse Side of Repair Order

Tool Room Service.—If tools, jigs, and fixtures are made in a separate department or tool room, the head of that department must know what is wanted and when. This information usually comes from the Superintendent's Office in the form of a shop order, possibly with a blue print and detailed specifications made up by the Engineering Department. These orders sometimes originate with the foreman. A productive department orders direct from the tool room those tools which are regularly kept in stock and also sends through orders for the sharpening of tools.

The head of the tool room handles his orders for tools in the same way that the foreman in a productive department handles his shop orders. The Order of Work sheets, Delay Reports, and Man Record Charts are identical and his costs are arrived at in the same manner.

Service from the Superintendent's Office.—It is the duty of the Superintendent's Office (it may be known as the Manufacturing Department or the Planning Department) to tell the foreman *what* work is to be done and *when.* This is done on Shop Orders, as outlined in a previous chapter, with the date of beginning shown for each operation so that there will not be any doubt as to precedence of work. The Superintendent's Office sends the necessary orders for tools to the tool room and for materials to the storeroom, with definite instructions as to when they should be ready. Copies of these orders are given to the foreman of the department in which the work is

to be done so that he can call for the tools and materials when he is ready to use them.

The Superintendent's Office checks the Order of Work sheets received from the foremen to see that the orders are being done in the sequence desired according to the latest information.

The Superintendent's Office helps the various foremen avoid the delays which they list on their Delay Reports. This office also records the progress of work in order to see that its plans are followed.

Storeroom Service.—It is the duty of the Storekeeping Department to have material ready when it is needed. The Superintendent's Office, when it issues orders to a productive department, advises the storekeeper what material will be needed and when, so that it can be reserved and delivered to the foreman when he calls for it.

The methods used by the storekeeper in handling his material are the same as those outlined in Chapter III for the foreman to follow in keeping his own stock of tools and supplies. In a large storeroom, however, it is necessary to keep a set of balance cards on which receipts and issues are entered. These card records are checked up with the amounts in the storeroom whenever the order point is reached or the supply is exhausted, in order to help the storekeeper avoid running out of stock. These balance cards also tell him at any time the amount he has in stock without an actual count being necessary.

Inspection Department Service.—How standards of quality are agreed upon by the Sales Department, the Engineering Department, and the superintendent was outlined in a previous chapter. If there is a chief inspector, it is his duty to see that these standards of quality are lived up to. If there is no chief inspector, this duty falls upon the foreman; but he should not, in any case, have to determine the inspection standards. It is the foreman's duty, however, to tell the inspectors what work they are to do first if they have more than they can complete in a day. A copy of his Order of Work sheet will tell the inspectors the proper sequence of work.

If inspection is done in an entirely separate department, the chief inspector is given a copy of the Shop Order on which inspection is shown as one of the operations. He handles his Shop Orders just as any foreman would, also his Order of Work Sheets and his Delay Reports.

As was pointed out in a previous chapter, the closer the inspector is to the machine the more effective will be the results of his work. If he is capable, not only of picking out the flaws in a piece of work, but also of knowing the reason for the error and teaching the operator how to avoid that error in future, he will have a much more constructive influence on the shop.

Engineering Service.—If the foreman is asked to work out the processes of manufacture, a great deal of his time will be taken away from the actual running of his department, and it is for this reason

that such work is usually done by specially trained men in an Engineering Department. In many plants this work is carried further and, after the best method is worked out, it is written down together with the time each operation should take. Such departments have a vast fund of knowledge at their disposal which the foreman can use to advantage. The actual value of his work depends entirely on the use that is made of it by the foreman.

Employment Department Service.—In order to make use of the service which the Employment Department is ready to render, the foreman must write out a "Requisition for Help," specifying the abilities and qualifications necessary in the desired worker.

When it receives this requisition, the Employment Department communicates with its sources of supply and selects from the applicants those who appear to be best fitted for the work. The foreman then has an opportunity to interview these men and determine whether or not they are capable. However, it is only when a new man is tried out on the work that an intelligent estimate of his ability can be arrived at. Whenever advisable, the foreman will, after securing the superintendent's approval, send to the Employment Department a "request for transfer of employe" or a "request for change of rate." If an employe leaves, the foreman makes out a "notification of leaving," which he sends to the superintendent and to the Employment Department for

approval, and a "final pay order," which he sends to the Cost Department. The forms mentioned in this paragraph will be given in Book IV.

Welfare work is usually looked after by the head of the Employment Department or some one delegated to do that work. It is a service which is of great value to the foreman. If one of his men is taken sick or injured, the hospital gives him expert care. If lunches are served and baseball diamonds and handball courts provided, his employes are kept in better condition physically and mentally and they can do better work.

Purchasing Department Service.—A requisition for the purchase of equipment may originate with the foreman, the Engineering Department, or the Superintendent's Office. A requisition for material originates usually in the Superintendent's Office or the storeroom, although in some cases it may originate with the foreman.

These requisitions must show:

What is wanted, with full specifications as to quality or grade.
Purpose for which the material is to be used, so that it may be charged to the proper account.
Quantity wanted.
Date when required.

It is the duty of the Purchasing Department to obtain quotations from supply houses for all materials, supplies, and equipment. After considering the prices, quality, and deliveries, the Pur-

chasing Department decides from which firm to buy and makes out a purchase order. It is the duty of the Purchasing Department to follow that order up until delivery is secured.

Section II

Service by the Foreman for His Associates

Service to the Workman.—A good foreman makes it his business to remove all the obstacles which stand in the way of his men in order to leave them free to do their jobs—the things which they are paid to do. The workman who thinks, knows that he can not continue indefinitely to get paid for a good day's work when he does only half a day's work, and he resents the continued recurrence of difficulties which will not enable him to do a full day's work.

The foreman who removes these obstacles releases the energy of the workman and allows him to make use of his creative power. America is the greatest of industrial nations and, to a greater extent than in any other country, our pursuits of happiness should be through work, for if a man does not find happiness *in* his work he must change his attitude toward it or else find the right job. The foreman who is most successful in removing the obstacles which prevent the full exercise of a workman's ability is rendering a real service to that man.

The foreman helps this man when he sees that his machine is in condition to turn out good work and when he plans the movement of materials through the shop so that the man will not have to stop his work and hunt for material.

The foreman helps the workman when he issues the necessary orders for tools and follows up his orders so that he can get the tools to the workman before he is ready to use them; and when he keeps the necessary supplies on hand, a lack of which would compel the man to quit work.

The foreman helps the workman when he gives him the necessary instructions as to what he is to do, when he is to do it, and how; also, when he takes pains to see that these instructions are understood. This training which the foreman gives the workman is possibly the *greatest service* he renders. He finds out what kind of work a man is best fitted to do and gives him the necessary training to enable him to do that work well. He makes good workmen out of poor workmen. When they learn to do even one job well, they get a different outlook on life. Men who for years have considered themselves "wage slaves" gain confidence in themselves and a control over themselves which makes free men of them. They show possibilities which were entirely unsuspected until they mastered their jobs.

Protection of the Workman.—The foreman renders service to the workman when he provides the best guards and safety devices and good working conditions. He looks at the shop from the

point of view of the workman and attempts to give him as safe and healthy working conditions as he would maintain in his own home. There is no more reason why he should allow a machine to be unprotected and thereby run the risk of catching a man's sleeve and crushing his arm, than to leave a stairway unprotected at home and endanger the lives of his family. In his own home he would not think of eating or sleeping in an unsanitary basement, and in his shop he is equally careful not to allow his men to work under unhealthful conditions. He provides as much light as possible by keeping the windows clean; and he places nearest the windows those who have the closest work to do. When there is not sufficient daylight, he provides good general illumination and places adjustable lights over the machines.

The foreman arranges for sufficient heaters to keep the department warm enough in winter to enable his men to do their best work, and provides whatever ventilators are needed to keep the air fresh and protect the men from drafts. He does not need to be told that the losses due to the slow work of men in cold or badly ventilated shops are infinitely greater than the cost of heat and pure fresh air.

The foreman keeps his washrooms and lockers scrupulously clean and does not allow material of any kind to accumulate on the floor of his department. The fact that he keeps the shop as a whole in an orderly condition has a direct influence on

the way his workmen keep their tools and machines.

For those of his men who sit down the foreman provides stools or chairs which are substantial and are carefully adjusted to the height of the bench or machine. It is very shortsighted to allow a man to tire himself out, month after month, when a chair, if conditions permit, would considerably reduce his fatigue.

Providing safe and satisfactory working conditions is a real service to the workman, but the foreman also knows that such service results in increased profits for the owner of the business. Workmen also know that this is a fact, so the foreman takes care never even to hint that he is doing the men a favor by keeping the shop clean and safe.

A Buffer for the Management.—It is the foreman who interprets the management to the workmen. If he is dictatorial, he will nullify all the broad-minded policies of the management. If the foreman bases his decisions on impressions or influence, there is little use for the management to attempt to better its treatment of workmen.

On the other hand, if the management is inclined to be autocratic, the foreman can get at least a certain measure of democracy into the management of his own department, which will slowly but surely influence the policy of the firm. He can show how much better results can be secured from a department run by democratic

methods than by the old-fashioned method where "the king can do no wrong."

Divided Responsibilities.—In assigning clear-cut jobs to his subordinates and avoiding divided responsibilities, the foreman helps his men for he makes it easier for them to make good. A foreman came into his department one morning and found two of his subordinates in a heated argument. One of them had fired a boy the night before and the other insisted that he had no right to fire him. The boy had been working for both of them and the previous night he had made a mistake. When called to task, he had talked so impudently that the man he had been working for at that particular time fired him. The boy came back next morning to get his pay envelope only to find that half of him was fired and half was not.

Of course the foreman had a good laugh at the situation, but at the same time he realized how impossible it was for a boy to make good under such circumstances and he took the time to go over the rest of his organization and see that there were no more divided responsibilities.

Increased Capacity and Rewards.—The foreman helps the workman when he bases his wages on the amount of work done, for he gives him an incentive to increase his capacity for work. When he promotes the best producers to more difficult work which pays better, he adds the stimulus of promotion to the increase in wages. Although this is helping the workman, it is of course only

plain justice to reward him according to the service he renders.

Your records of production and the basing of wages and promotion on those records gradually eliminate special privilege of all kinds in the shop. If a man who is in a position of authority continually fails to do what is expected of him and the record of his work is open to those around him, he cannot continue to hold that position of authority. He will usually appreciate that fact in time to save himself and do the work as it should be done.

By this method of keeping individual records of production and of systematically attempting to remove the obstacles which stand in the way of complete accomplishment, a remarkable degree of cooperation is secured and possibilities developed in the workman which would otherwise have been impossible. His initiative and ambition are stimulated. The foreman gives careful consideration to his suggestions for improvements which will increase his output, because it is to his interest to do so since an increase in output will lengthen the foreman's production line as well as the operator's.

The workman sees the man whose line is longest, whose production is greatest, appointed to the position of sub-foreman when there is a vacancy. He sees the sub-foreman who is most successful in developing his group of men become a foreman. As he watches these changes take place throughout the organization and positions of

authority given to men who "know what to do and how to do it," he sees opening up before him possibilities of advancement limited only by his ability and his energy.

Service to Other Foremen.—A foreman helps other foremen by delivering material or parts in process to them when he has promised to do so. If conditions beyond his control make it impossible for him to live up to his promises, he tells the other foreman the reason and makes him a new promise which he can live up to. Nothing in the foreman's job is quite so exasperating as the chasing up of material which has not come through on schedule.

The foreman who keeps his machines running and lives up to his schedules enables other foremen to keep their machines running and to make good their promises.

That foreman is of most help to other foremen who is frank and open in all his dealings, prefers facts to opinions, is not looking for credit—is, in short, the typical, straightforward American foreman.

Section III

Service to the Management by the Foreman

Service to the Superintendent.—The foreman helps the superintendent when he makes the best possible use of the machines in the department of which he has charge. He sends copies of his

Machine Record Charts to the superintendent so that he can see how well his equipment is being used and the obstacles which prevent him from doing as well as he would like to do.

The superintendent has an opportunity to talk over the charts with the foreman and get at the detailed reasons for idleness, if necessary. If the trouble is repairs, the superintendent consults the foreman of the Repair Department, investigates weaknesses of machines, and arranges to have repairs made more promptly. If idleness of machines is caused by lack of help, the head of the Employment Department is consulted and, if necessary, the wages offered are raised or new sources of supply are opened up. In short, the superintendent is enabled to get at the causes of idleness and to apply the necessary remedies and in this he can be more successful than any single foreman, because of his greater experience and authority.

The superintendent can also see from the Machine Record Charts the effects of his decisions or instructions, or, if no effect is apparent, he can find out whether or not his instructions have been followed.

The foreman helps the superintendent by showing him on the Man Record Charts what his men are accomplishing and what prevents them from doing more. Here again the superintendent is given an opportunity to get at the detailed reasons for idleness and to use his broader authority in removing obstacles. He can see how well his men

are fitted to do the work assigned to them and can transfer to other work those who are least fitted for their jobs.

These charts enable the superintendent, not only to study the conditions in his shop, but also to see very clearly any tendencies toward poor production and to take whatever steps are necessary to guide the shop in the way he wants it to go.

The foreman helps the superintendent when he turns out his orders in the proper sequence, when he reports what he intends to do and what he has done, and when he calls the attention of the superintendent to the things on which he needs help. This sorts out for the superintendent the most important things for him to do each day and enables him to get more done than if he had to walk around his shop and ask each foreman what his troubles are. Instead of spending his time trying to get information, he devotes it to removing obstacles.

The foreman helps the superintendent by showing him the load on his machines, that is, the amount of work ahead. From this layout he can tell how long the machines will be busy with the orders he already has in hand. This enables the superintendent to make accurate plans for the use of the plant as a whole and, if necessary, to take up new work, to purchase new equipment, or to dispose of unused equipment.

The foreman shows all these facts to his superintendent without fear or favor, with the result that the superintendent can keep in closer touch

with the shop than he could possibly do from verbal reports alone. The foreman can also secure from the superintendent the help he needs with little delay.

Service to the Cost Department.—The foreman sends to the Cost Department his production cards (they are sometimes called *time* or *job* cards) showing:

What work was done.
Who did it.
The time taken to do it.
What was paid for the labor.
The machine used.

From these production cards the Cost Department makes up its pay roll and secures records of the cost of the work done in the shop.

The Cost Department tabulates these records and sends back to the foreman the cost of work done compared with previous costs or, if it is special work, compared with estimated costs. From the foreman's point of view the only reason for keeping cost records is to use them in reducing future costs.

Service to the Owner of the Business.—The foreman helps the owner or the manager by reducing the cost of manufacture through the elimination of idleness and useless work. This refers both to men and machines. By reducing this burden of idleness and useless labor, the foreman makes it possible for the owner to pay productive

workers more liberally and according to the amount of work they do. He thus helps to build up the reputation of the company by getting work done on time, at a reasonable cost, and of standard quality.

The ability of the foreman to train and develop workmen is one of the greatest assets of any company, for the value of an industrial plant is measured by its productive capacity—the ability of its organization to turn out goods—rather than by the inventory value of its land, buildings, and equipment. In other words, the value of a business is determined by the rate at which it is moving and not by the appraised value of bricks and mortar. The methods used by the new type of foreman focus the attention of the whole plant on production and show the progress which is being made toward that end.

The Owner Relies on Reports.—Usually it is not necessary for the owner to follow all the details of the work being done in the various parts of his plant; but he will follow the progress made on the principal classes into which the output can be divided. If the progress made on one of these classes is satisfactory, he will need to pay very little attention to it. If, however, another class of work is behind schedule, he can call for the detailed charts which are in the hands of one of his foremen. From these records he can see what particular items are being held up and the reasons. When he locates the cause of the delay, he can concentrate his efforts on that particular prob-

lem and overcome difficulties which to his subordinates are insurmountable.

These methods make it unnecessary for the owner or general manager to go through volumes of reports or to go the rounds of his superintendents and foremen in an attempt to find out what work is not progressing satisfactorily. His subordinates are likely to minimize the importance of delays on some items and not to realize the effect a short delay will have on the remainder of the work.

By providing good working conditions and reducing the fatigue of his workmen, the foreman increases their output and directly affects the profits of the company. By introducing a greater measure of democracy in his own department, he places his organization on a firmer basis and makes it easier to go through unsettled conditions without disturbance to production.

On the charts kept by the foreman, the owner can see the facts in regard to the service rendered by the various members of his organization, and it is no longer possible for incapable or lazy men to occupy positions of authority without the owner's knowledge.

The Foreman's Reward.—When a foreman realizes that the old type of management does not render the proper service to the owners of the business or to the public, and that it oftens works real hardships on the workmen, he determines that his shop shall be so well managed that there will be fair play for all. He finds that the key

to the situation is idleness. His records of men and machines show a surprising amount of idleness, but a study of the reasons makes it possible to fix the responsibility and remove the causes.

In order to keep his machines busy and to enable his men to do a fair day's work, he installs simple and effective methods of getting work done. These methods lay facts before his workmen and himself and greatly improve their relations. There is no room for suspicion and no opportunity for arbitrary action. Each learns that it is to his advantage to help the other. The workman follows the foreman's instructions because they enable him to turn out more work and to get larger wages. The foreman devotes more attention than ever before to the training of his workmen. Discontented workmen are cured instead of being fired. Workmen are promoted from the bench or machine to positions of responsibility because they know what to do.

This foreman has a shop which is "organized for work" and, because it does turn out work, he gets his financial reward and, even better than that, he has the satisfaction of doing a job well and of rendering adequate service to all those with whom he comes in contact. Instead of being a drag on industry, he becomes part of its driving force.

The good foreman knows that he can be permanently successful only when he secures full justice for the owner and for the workmen.

Part II: The Foreman

THE FOREMAN AND THE SOCIAL ORDER

Section I

The Foreman and the Community

Effects of Industries on the Community.—Communities are affected by the industries which are maintained within their borders and by which the communities subsist. Towns even take on their physical characteristics from the kind of work which is done there and the houses in which the work is executed. Workers drift from town to town largely because they have no deep interest in their social surroundings and do not feel themselves to be a part of their community or particularly important in its considerations. Many of them do not visualize their own responsibility to do what they can to make their communities better. Education in the schools, recreation, neighborhood development, parks, transportation—these things are of the utmost importance to the worker for he depends upon them, almost wholly, for the development of his children, the health of his family, and the amusement of himself. He should, therefore, take an interest in community matters.

A good part of the wakeful hours of each day is spent getting to work, working, and getting

home from work. The work which each man does colors his thinking, and makes itself felt in all his actions, both in the factory and in the community.

Not long ago, a meeting was called to discuss plans for improving a small community near New York. One of the men at the meeting was a skilled mechanic and a very thoughtful man. He talked with his *pencil.* That is to say, he sketched working drawings of the plans he was presenting. He had been working so long with blue prints and dimensions in his own operations that he *thought* in the same way and it came out in his conversation. His occupation influenced his manner of talking when he was among his friends in the community.

In industry, we have not paid as much attention as we should to the way in which men's occupations color their thinking and how that thinking, expressed in action, affects the community. You should, therefore, understand that your influence as foreman of the group which you govern is not confined to their work and their attitude toward the organization of which you are a part, nor particularly to the occupation in which they are engaged. The influence which you exert can be extended toward aiding the workers to exercise their responsibilities as part of the community. Thus the community may improve along the lines that are most valuable for the workers themselves, the place in which the men work, their understanding of the organization with which they work, and their understanding of the way in which

those organizations affect the community. The better understanding in the shop means a better understanding in the neighborhood and a better understanding in the community itself.

The influence of the shop radiates into the community even more than the influence of the community backs up into the shop. It is in directing this shop thought that your influence as foreman can be used to the advantage of the community.

From the earliest time, the craftsman has been an important factor in the life of his community. To make a useful product, or to do a useful service, is about the most important thing in life anyway, and the men who do these things have always given a certain character to the town or the village and finally to the larger political group.

The Social Conditions of the Town.—The town or village is the smallest political unit just as your group of workers is the smallest industrial unit and the family is the social unit. Formerly every man made laws for himself and for his family. There were no laws between families, and there were no orders imposed upon the family circle from the outside. As people became more intelligent, they saw how foolish it was to spend time in fighting with each other, as families, when they could spend that time more usefully in making things. They found out that they could live together under simple laws which would leave them free to make things needed by all if they would stop fighting and stealing. So they agreed to give

up some of their cherished rights by conforming to a law that any man who killed another or who stole anything should be punished.

Gradually they discovered that, instead of each man acting as his own policeman, it would save time and enable them to live more comfortably if they hired men to take over the job of policing as their regular service. That is how the village or the town evolved its laws and regulations, with its special men for protection, for health, and for the discharge of the functions of government in the township.

Living together in the town peacefully is based upon two fundamental responsibilities:

First, the responsibility of abiding by the laws which a man, as a citizen, has agreed to.

Second, the responsibility of respecting his neighbors' rights as scrupulously as he demands respect for his own.

It is because we know how necessary it is for these laws to be observed and for these rights to be respected that we have an organization operating against those who do not obey the laws, and who do not respect the rights of their fellow-citizens. We know that, unless all but a small proportion of the people obey the laws without coercion and respect the rights without demand, civilization would be impossible and we would go back into chaos with consequent destruction.

The *work* which a man does is the great educational factor in his life, and it was out of the necessities of work that the social civilization

grew. It is out of industry today that improvement in social conditions must come, very largely; and the foremen in industry, as the top sergeants of this great army of workers, can be a very valuable force in the improvement of social conditions through their industrial influence.

Public Unconcern about Civil Matters.—I was asking a friend of mine—an intelligent railroad conductor—about the educational system in his community, and he was obliged to confess his ignorance of the things which were taught, the character of the teachers, or the method of teaching. He said those things were up to the school board. Maybe; but it is absurd to teach children a lot of useless things; and a teacher with wrong views about life or society or industry can make a deep impression upon the thinking which will be done by the children when they have grown older. Parents are the logical persons to take an interest in what is taught their children and who does the teaching.

You would not think much of yourself, as a foreman, if you had an assistant hired to do part of your work and you did not attempt to find out whether the work was being done well or ill. Too frequently, however, we forget that we, as citizens, are responsible for the kind of organization which there is in our community. We also forget that the production part of our community life is, after all, the most vital part and the most potent in its influence upon the social organization.

Service to our neighbors, socially, is just as important as service to people industrially. The work of building a bigger and better community starts in building a bigger and better understanding in our little group in the shop. If we can manage to put a little of the thought which we expend upon our work, during working hours, into work for the benefit of the community and the neighborhood during the rest of the hours, there is no reason why the influence exerted by the shop on the town should be anything but valuable and for the betterment of our life, comfort, and convenience.

Section II

The Foreman and the Public

No Group Is Independent.—In the attempt to do all the great work of keeping modern civilization at its required speed, we have become separated into groups so far apart from each other that we voice our opinion of the other groups as though we could live without them, and as though they had no usefulness in the scheme of things. We give them names that mean very little, and we do not seem to appreciate our dependence upon each other as groups.

For years, many manufacturers talked about the railroads as though they could give them their trade or not as they chose. They did not seem to realize that if the railroads could not move goods

fast enough the manufacturer would be the first to suffer.

We talk *labor* and *capital* as though they are separate and distinct, and as though they have no intimate dependence on each other. We forget that money which you and I have saved and put into the bank is loaned on collateral to various businesses for operating purposes, and that our savings suffer when capital is disturbed. The money, which the Bolshevik government gave to the *Herald* in London for propaganda, was supplied through the smooth working of the banks which act as the clearing houses of capital; and the very government which was occupied in destroying the capitalist system was supplying the money for its own work by means of that system.

We do not realize that modern civilization has made us all neighbors, and that all are working in the same shop. We need each other so badly, in order to supply what each can't make for himself, that we are all in the same boat. If I make bricks for a living, somebody else makes my hats, shoes, and clothes; supplies me with cigars, coal, gas, and electricity; provides my transportation to and from work, and a hundred other things which I must have. I am indebted to other men for my reading, my amusement, my recreation, and my comforts. If I worked from early morning till late at night, I could not make for myself more than a very few of these things, and they would be clumsy and crude and frequently of limited use. To supply any man with the things

which equip his home—no matter how modest—it is necessary to collect materials from a number of countries, and keep thousands of men at work in many lines of endeavor. The whole life of modern civilization is centered upon producing goods or service for people, distributing the products and the service, and organizing our operations so that this work can be done with least confusion and in the shortest space of time. It is because we depend upon each other so much and have organized this dependence, that we can get our work done and still have free time for amusement and recreation.

We Are the Public.—Take any magazine or newspaper and read the articles about the public, and you would think that the *public* is some separate part of the community which buys all the goods and service which the rest of us are making. Not so; you and I are the public. We are the ones who buy all the stuff we are making. Only, instead of buying from myself, I am buying your work and you are buying mine. We are the public, buying from each other the products we have made; and selling to each other the goods we make. So, when we talk about the *public* we are talking about ourselves. Our trade must be on a mutually profitable basis or we cannot continue to live as we do today. We are the market for our goods (speaking of the whole country) and unless we work together, with some reasonable degree of agreement, we will have to suffer, be-

cause we will not make enough things to go around.

We Are All Consumers.—You need the things which some other men are making just as much as they need what you are making. You want good service from the men who are making things for you, or rendering you any service, and you do not want to pay more than it is worth, any more than the other man wants to pay you more than it is worth. You want the service he is rendering—in fact, it is necessary for you to have it; and he needs the service you are rendering—that is just as necessary to him. As a worker you have an obligation of service to the other fellow, and as a consumer you have a right to demand that same obligation from him. We cannot get more than we give in a world where we depend upon each other as much as we do in this modern civilization of the United States.

What Does Education Amount To?—There are a whole lot of men who think an educator should be content to get a small salary, "for," they ask, "what does education amount to, anyway?" They forget that it is the wide spreading of knowledge which has given us this marvelous mechanical development with its wonderful conveniences and comforts. They do not see that it is this constant attempt to give knowledge to thousands of people and teach them how to think better which has made it possible for these men to study out the improvements that have given us the thousands of conveniences, amusements,

comforts, and advantages of which our grandfathers knew nothing.

All men are a part of the public. All men are consumers of *many* things when they are only workers at *one* thing. All men are educators, influencing other men for good or bad, and all men are citizens of a country and of a state. They are residents of a community where they are politicians, either good or bad in their attitude or influence. So do not be fooled by such terms as the public, the consumer, the worker, the educator, and so forth, which we are so fond of quoting. Do not imagine that these men are not like we are and that we have nothing in common with them. We are the public, we are the educators of all who are working or playing with us, we are the workers, and we are also the politicians; for the government is ours and it is as good or as bad as we make it by our influence and our votes.

See That Your Men Understand.—As a foreman you should see that the men in your group have some understanding of these things and your service to your fellow-workers will be increased many fold by the proper development of their ideas in these respects. A general understanding of these matters will open the way to industrial improvement and social improvement beyond the greatest dreams of the most intelligent of workers, and will be of more benefit than all the theoretical programs put forth by impractical visionaries.

Section III

The Foreman and the Town

Rise of the Town.—What is the thing we call the town, the city, or the village? A good many men have studied these aggregations of human beings and have written many books with long words and much argument to prove that the whole system of social organization has grown up for this reason or that reason. We are not concerned with these weighty matters here, but it is well to know a little about how these social groups grew. Maybe by that means we may find out our place in them and what they mean to us.

Well, when the old Saxons conquered England many hundred years ago, the leader and his wife, with their followers, their children and their servants' children, their horses, cattle, sheep, and so forth, settled on some land, where they built a number of rude wooden houses, surrounded the whole with a strong fence and called it a town. Everybody that belonged to the same outfit lived together, fought on the same side, and worked to benefit the same crowd. They were in the same *town*. They lived together peaceably, although they might fight often with the people of another town. The principal occupations, outside of fighting other towns, were farming, the making of clothes—with all the processes that the job implies—and, in fact, the making of everything that was needed, from the weapons and the tools to the ornaments for the dwellings. Every year the

men of the town met together to decide on the rules and regulations which they would agree to abide by and to choose such leaders as would best serve the interests of all.

The Town Meetings.—There are some things which can be worked out for the people who live in the same place and have the same common necessities. These matters can best be taken care of by the cooperation of all the people living in that place. Thus the town becomes a cooperative unit. In early days, when the town was gradually being organized, one representative of each family—the head of the family—was entitled to his say in the affairs of the town and to register his opinion about them. That is how the voting in town meetings arose. As the towns grew larger, the citizen could not leave his work every day to attend a town meeting to decide something which was important, perhaps, but not so important to him as his work. So the citizens decided to elect from their number certain men, who would be paid to spend enough time on the town matters to get them done, one man to be chosen for every so many citizens. The men who were chosen in this way were expected to take the burden of town affairs from the shoulders of the townspeople; and the people decided that each citizen should give, according to his possessions, a certain sum to the town to provide the money to pay the special representatives who were to get the work done.

Industry vs. the Town Meeting.—If we were to compare the town with an organization in

industry, we would say that the little group of workers under the foreman, concerned with the same piece of work, is to industry the same as the family to the social unit. This group is the oldest and smallest industrial cooperative unit. The town would be represented by the factory which is made of many small groups working on a common object in the same place with the same heads and the same policy.

Both the town and the factory are the most important units in the cooperative effort in modern life. They are the places where the cooperative problems must be worked out first. They are the units which must provide a unity of development before the greater cooperation can become effective; and they are the places where the necessary understanding must be worked out.

What Factory Organizations Mean to the Town.—The town will transfer into its social life the kind of organization which exists in the factories located within its borders. If there is no unity in the factory, if there is no attention to the proper understanding, there will be little cooperation in the community and much division in its councils. Many are the towns which illustrate this. Men are chosen, not because they are capable of being most beneficial to the town and its necessities, but because they represent the labor union, or they are known to be supported by the manufacturers, or they are liked by the merchants. There is no unity of understanding as to the mutual obligation which rests upon the citizens to do

the work of the town through the choice of the right men to run it and administer its affairs.

The town is divided in its councils because the working life is divided and there is no understanding of the mutual dependence in either case. The merchants do not understand how closely their welfare is dependent upon the welfare of all the citizens, so they feel that some of the representatives should represent the merchants' interests only. The workers have no confidence in the management of the factories and think that they will want to run the town for their own benefit, so they insist on electing, not the best men for the town, but the men who will protect the workers' interests exclusively. The manufacturers feel that they are expected to furnish too much of the money to run the town without having the chance to say anything about how it shall be spent, so they try to assure themselves of the friendly intention of the candidates for the offices.

Good Industrial Organization Means a Good Town.—If the industrial life of the town is run on a basis of mutual understanding the town will begin to operate along right cooperative lines. You see how intimately the life of the town is associated with the life of the industries within its borders and the kind of men engaged in these industries. The community is the same group of men who run the industries—the management and the workers. These men are no different in spirit when they work for or think of the town than they are when they are thinking of their

work. They are more interested in their work and are likely to be more intelligent in that matter. That is the only difference. The spirit is the same, however, and it will find its expression in the character of the town, the divisions in its politics, the methods of its operations, and the results obtained.

The Foreman in Local Politics.—Your influence is of importance in the improvement of town affairs. A new spirit in the town will react upon the workers and management in the industries of the town and on the merchants. You can improve the whole community when the work and spirit of the town are improved. The whole life of the community is too cooperative for an improvement to be effected in one place without this improvement affecting the rest of the community.

No man has done his duty when he has merely done his work and voted his ticket. His obligation for service to other men in industry is no greater than his obligation for service to the rest of the community. The one must be considered with the other, if both are to have their measure of improvement in the future as they have had in the past. Indeed, they must improve to a greater degree if they are to keep pace with the multiplying requirements of the future population. Just as it is the spirit of service, mutually discharged, which will improve industry, so it is the spirit of mutual service which will help the community.

Section IV

The Foreman and the Government

What Is the Government?—The government, at least that part of it which we term political, is divided, like industry, into large and small units of operation. It is really the development of the orderly life of the people toward the management of their common or cooperative affairs. The necessity for these cooperative affairs can be illustrated in the making of roads. If a number of people living on the same *street* want that street improved, they can get together and agree to an assessment of the property to take care of the cost. If the community wants to plan out improved streets for the whole *town,* then it is necessary for a majority of all the taxpayers to agree to having the streets improved.

Suppose, then, that it is desirable to extend these improved roads so that the farmers and country people can get in and out more easily; it is necessary to have an agreement with the farmers, which means that the whole *county* is concerned. Again, there are a number of towns in different counties with needs for transportation between them. It becomes advisable, then, to provide good roads to give this transportation. It is necessary to get an agreement between all these places, and so it becomes a *state* matter to be decided by the voters of the state.

Government simply means the arrangement of the cooperative affairs of a number of people liv-

ing in the same town, county, state, or country, so that these matters will be taken care of properly and for the benefit of all the people concerned.

The Voice of the Voters.—In this country, the government is the *collective voice of the voters,* and the majority agreement is the decision. As the population increases and the affairs of co-operation—laws, regulations, construction of new conveniences, information, and all the other operations of common requirements—grow in volume and complexity, it is utterly impossible for the citizen to give his individual time to these matters. It would be impossible for the average citizen to arrange all governmental affairs in an orderly way even if he could devote the time necessary for such matters. Men are, therefore, elected by the voters, or appointed by the representatives of the voters, to conduct the operations of the government, to see that the citizens are protected, that laws are obeyed, and that the government services are properly rendered.

Government Is Business.—Government is nothing more nor less than the public business which you and I need to maintain our orderly and peaceful relations. Just as industry is government—the government of production and distribution; so government is business—the business of orderly social cooperation. Government is arranged as it is in order that we may do our work with less trouble and with more convenience, comfort, and recreation. Unless we understand this and use our votes and our citizen rights to see

that government is carried on effectively, we cannot go ahead with industry as we should in order to enjoy a fuller life.

We have mentioned the fact that you cannot expect to *get* service from other workers unless you *give* service. We cannot expect to secure our rights as citizens and keep them secure unless we fulfil our obligations as citizens. Our industrial progress and our governmental improvement are bound up in each other so intimately that each man must fulfil his service to each of them in order to secure his rights from both.

The Government Is What We Make It.—Very often the way we talk about the government would indicate that we think it is something entirely separate and distinct from our own work, our own life, and our own responsibilities. Just as we forget that we ourselves are the public—both producers and consumers of goods—so we entirely lose sight of the fact that *we* are the government and that we have only delegated the work of management to those we elect. The responsibility for good government still rests upon us as citizens, and the progress governmentally will be just the kind of progress we permit.

Rights vs. Obligations.—In the Preamble of the Declaration of Independence there is a reference to the inalienable rights of the individual. That means those rights of the individual which cannot be delegated to anyone else and which cannot be taken away from him by delegation of any kind. Of course, this does not mean that

some of us have those rights and some of us do not. If we are all created equal and have equal opportunity for life, liberty, and the pursuit of happiness, then it is obvious that we must recognize the rights of the other fellow to the same things that we demand for ourselves. The fact that sidewalks are public property and that I am entitled to walk upon them does not entitle me to jostle somebody else off the sidewalk because I do not feel like stepping aside.

It is a pity that we are always insisting so much on the rights which *we* have and the obligations which *other* people owe to us, and we pay so little attention to the rights which they have and the obligations which we must admit toward them. It is only because we recognize these rights and obligations in connection with all the ordinary laws, that we can live together in a peaceable society without much destruction. No police power could be used which would be big enough to oblige us to obey these laws, if we were not already convinced that they are necessary.

Government Is Service.—The basis of government is just the same as the basis of industrial cooperation. It is necessary for each worker to recognize his obligation for service to the other workers, and his right to demand service from them. In social life, it is necessary for us to recognize our obligation to observe the laws, to live peaceably with our neighbors, to take our part in government decisions, and to fulfil the rest of our obligations as citizens; just as it is our right

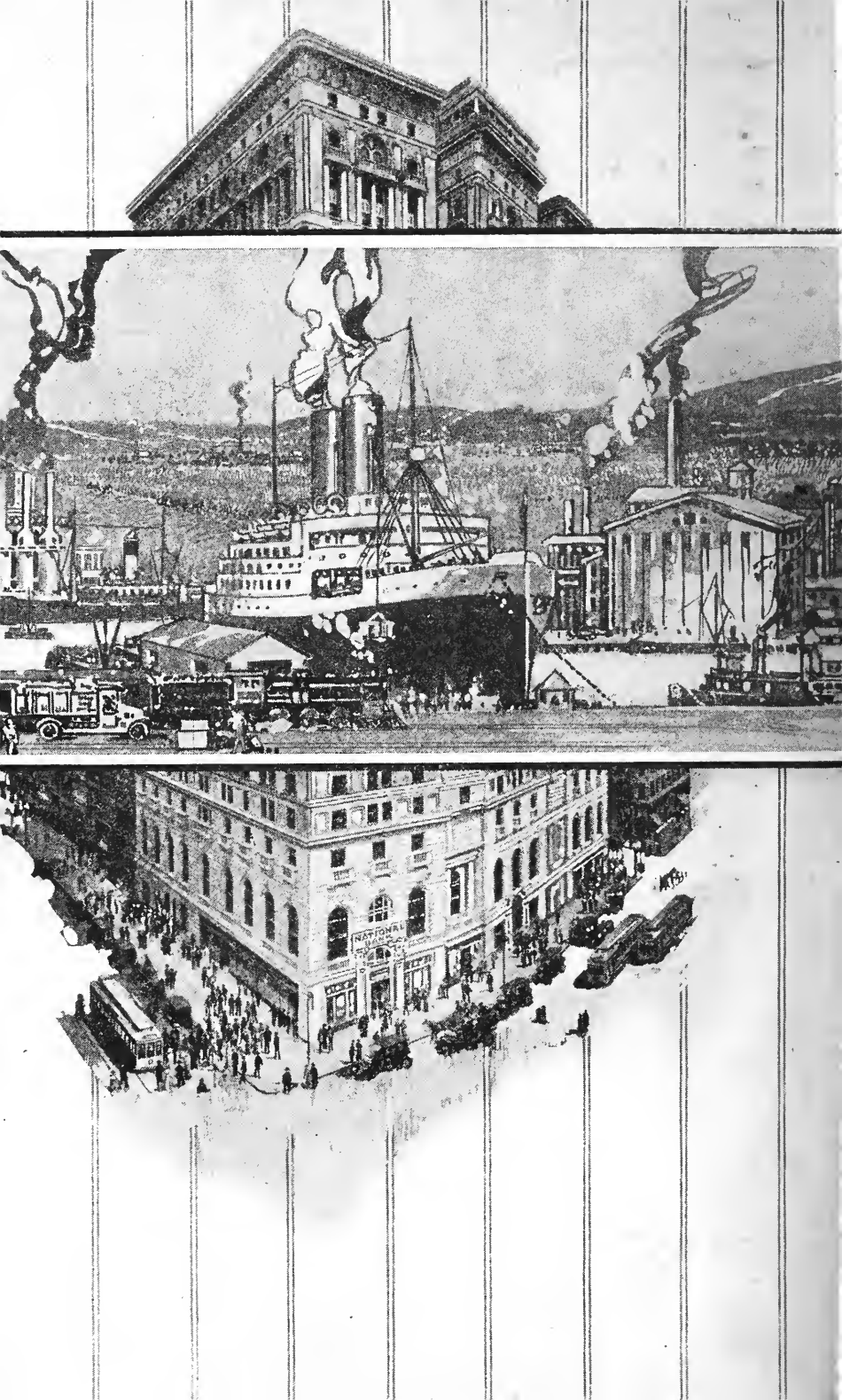
to demand the same consideration from the other citizens. If we attempt to get laws which will benefit ourselves only and which work a hardship upon others, we are taking advantage and attempting to secure something which it is not our right to demand. It makes no difference whether this be advantage in taxation or tariff; or whether it be advantage in fire, health, or road regulation; or laws relating to hours of labor and conditions of work. None of these is within our rights unless it benefits the whole community or is calculated to remove any injustice under which we labor.

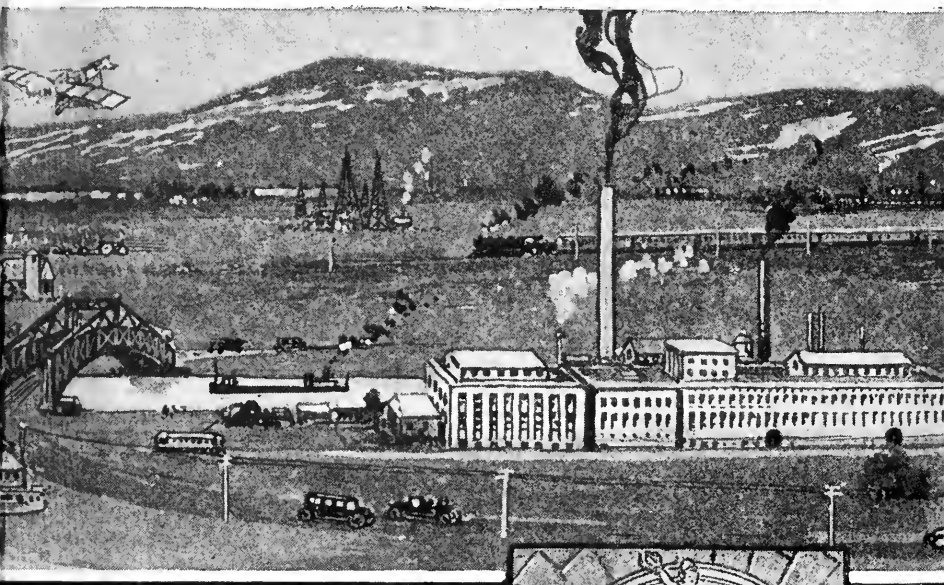
Cooperation Implies Discipline.—Cooperation means also *discipline* in the working out of all orderly government. A democratic government differs from an autocratic government mostly in the fact that the democratic government expects each citizen to *discipline himself* into recognition of the rights of the other fellow, the necessity of obedience to the law, and the discharge of all his citizenship obligations. The autocratic government disciplines its subjects in its own way without their consent or desire. It does not expect them to discharge any citizenship duties because of their personal discipline, but because it *orders* them to perform their duties.

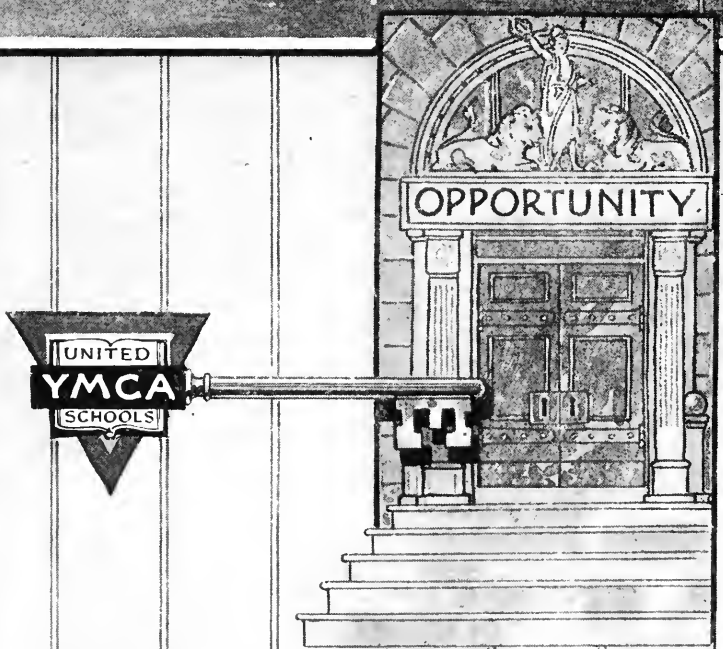
The democratic government depends for its success upon the way in which each citizen is *willing* to discipline himself in the discharge of his responsibility toward the general body, and this is the only basis on which it can progress toward unity of purpose.

Questions for You to Answer

1. What is "Democracy" in industry?
2. What data should go on a Repair Order?
3. How shall the foreman get cooperation from the tool room?
4. What kind of help should the Superintendent's Office give to the foreman?
5. How far should the foreman go in using the knowledge of the Engineering and other technical departments?
6. Name some specific forms of service which the foreman should render to his workmen.
7. What are the results to be expected when responsibilities are divided?
8. How can the foreman best serve the superintendent?
9. What should the owners of the business expect from the foreman?
10. What influence can the foreman exert on the community?
11. How intimate is the relationship between the industries in a town and its government?
12. What is your relation to state and national government?
13. What is just government?
14. What is the difference between "rights" and "obligations"?
15. What is necessary to get cooperation?


NATIONAL
SAVINGS

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